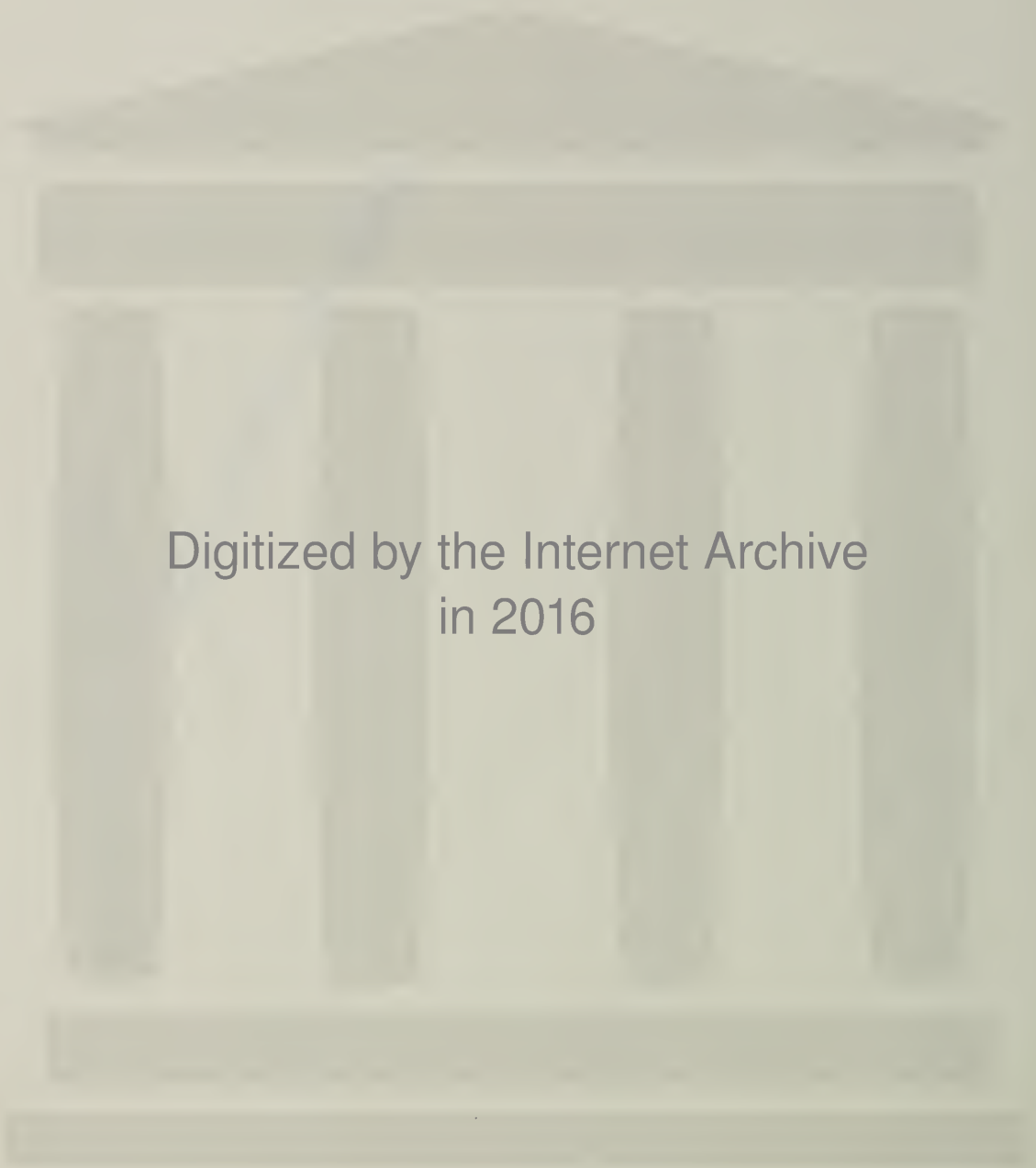
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MALIGNANT MELAN

AMYOTROPHIC LAT
SCLEROSIS OR SOMETHING
ELSE?

THE SCMA AND THE BOARD OF
MEDICAL EXAMINERS:
HISTORICAL PERSPECTIVE

HEALTH RISK BEHAVIORS IN
SOUTH CAROLINIANS

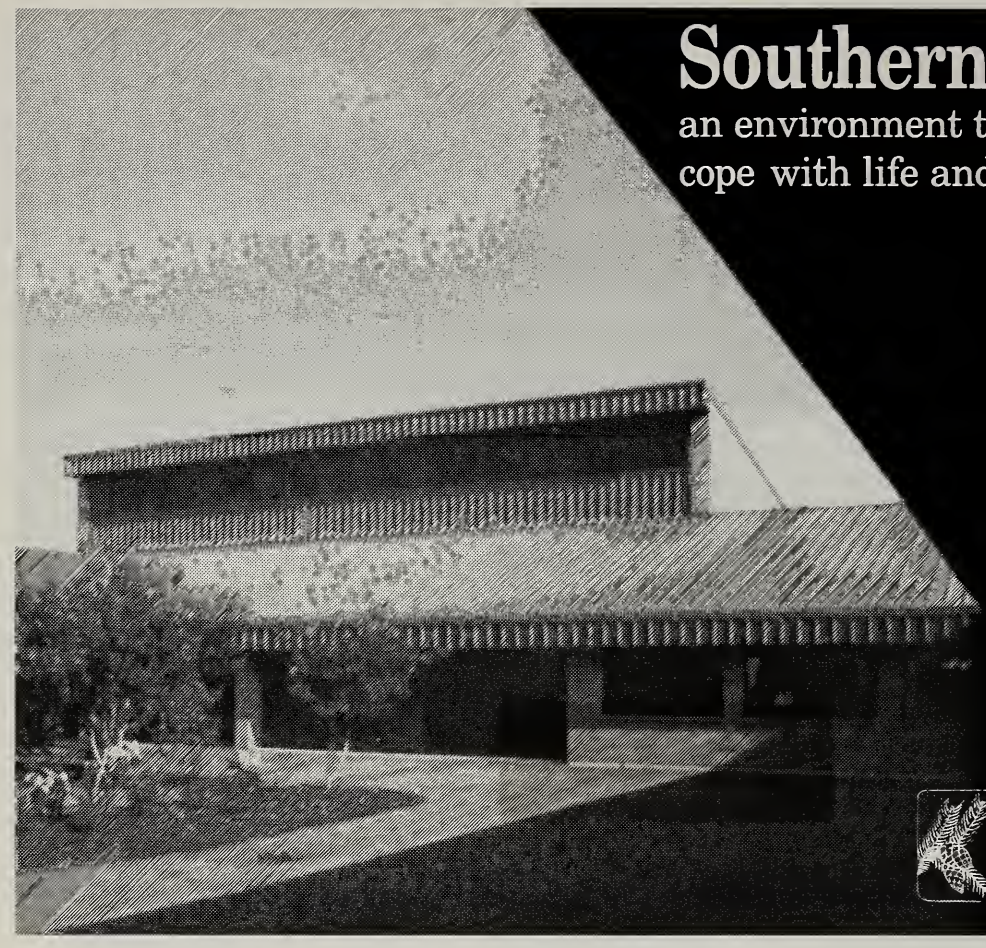
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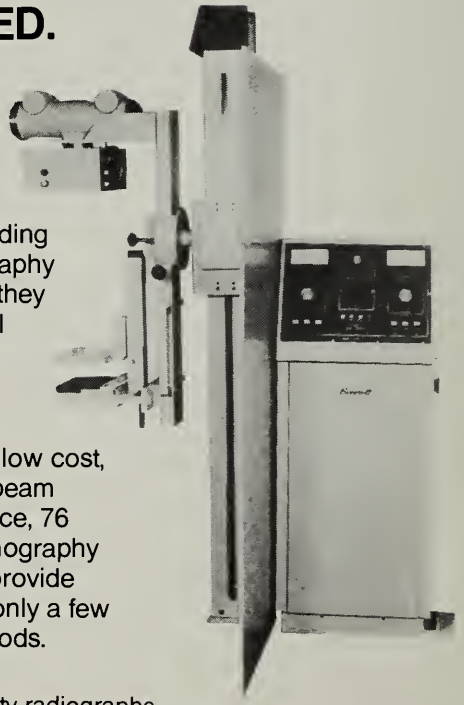
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President's Page



A TEAM EFFORT

Dear John:

My sojourn across the state continues at a fairly rapid pace. I've had the opportunity to speak to many of the county medical societies and will speak to some more before the year is over. I have been well pleased with the reception that our message about Tort Reform has been getting in the various cities. The turnout at the meetings has been good and I have a gut feeling that there is a basic enthusiasm to do something about this problem before it explodes. There is a sense of unity and purpose developing which impresses me as well as our Executive Vice President, Bill Mahon, who has been accompanying me on these engagements.

I'm also impressed with the commitment that Bill Mahon has to the physicians of South Carolina and am amazed at his energy and the amount of time that he is spending in our behalf. I know you have not met him personally, but if he ever calls on you by phone or letter I hope that you will respond vigorously with whatever help he needs.

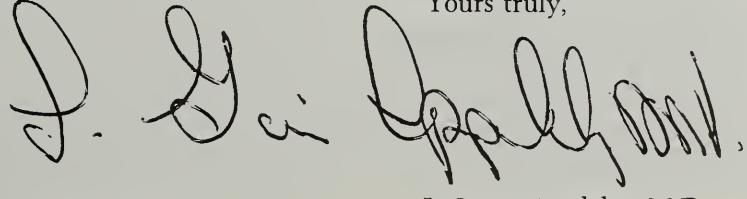
This is a team effort not only among the members but among the officers also. Charlie Duncan, our Chairman of the Board of Trustees, and Walter Roberts, our newly elected President-Elect, as well as all of the Trustees are making a concerted effort to bring the utmost pressure to bear on Tort Reform. It is my high hope that each Trustee will have an opportunity to visit each of the county societies in his area during these next several months to inform you of our programs and to enlist your aid in carrying them out. We have a very fine group of Trustees and their leadership is absolutely vital in this issue.

Well, some cool weather has finally hit this area and leaf falling time has really set in. Can't say I could ever appreciate this leaf business too much and I suppose the fact that a rake doesn't fit my hand very well doesn't do much to recommend it. It reminds me of those strolls we had around medical school stopping late in the afternoon at Creticos' to have a Coke and listen to some of the old man's wild tales about old Greece. It made you appreciate this country a little more to hear the harsh treatment those European monarchs and dictators gave the average person. It makes you wonder if we should be dictated to now and whether or not those elected representatives we sent should be passing laws not in the best interest of our patients or ourselves. I would think they would be a little more careful and respond to the needs of the people and not to some apparent political necessity. Let's all have more contact with our elected representatives so that they will know the true needs of the people and not make decisions for us on misinformation or a lack of facts. Properly informed I believe they will do the right thing.

The stories around Creticos' store were humdingers. Remind me sometime and I'll tell you about Bill Hunter's trip in the old black Mariah to Columbia and back, or about the freshmen in our class who almost failed sophomore pediatrics. That was really a dilly.

I have written you, now you write to me.

Yours truly,



J. Gavin Appleby, M.D.
President

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All manuscripts should be accompanied by a transmittal letter with the following paragraph: "This original work has not been submitted or published elsewhere, in entirety or in part. I (we) hereby transfer, assign, or otherwise convey all copyright ownership to the South Carolina Medical Association in the event that this work is published by the SCMA."

We request that manuscripts be concise (no longer than 8 typewritten pages, double-spaced), with no more than ten references. These should be cited in the text in superscript, e.g., "Bottsford, et al.[3]", and should conform to the following style: "3. Bottsford JE, Bearden RC, Bottsford JG: A ten year community hospital experience with abdominal aorta aneurysms. *J S C Med Assoc* 79: 57-62, 1983." Ordinarily, publication of four small illustrations or tables or the equivalent will be paid for by *The Journal*. Manuscripts should be submitted in duplicate. Reprints will be made available by the publisher.

THE JOURNAL
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VOLUME 82 JANUARY 1986 NUMBER 1

MALIGNANT MELANOMA

R. C. HAGERTY, M.D.*
P. G. PRIOLEAU, M.D.
F. A. McIVER, M.D.
R. F. HAGERTY, M.D.

Malignant melanoma has doubled in frequency over the past decade. Some 22,000 new cases were predicted for the United States during 1985, with 5,500 deaths.[1, 2] The incidence is twice as high in the Southern states compared to the Northern states; this is believed to be directly related to increased exposure to ultraviolet radiation.

The frequency of lymphatic and hematogenous metastases makes melanoma the most feared of skin tumors. However, survival rates can be improved with prompt diagnosis and management. It is therefore incumbent on all physicians to become familiar with the recognition and care of these neoplasms.

Our purpose is to review the cardinal features of melanoma and of certain other lesions which might be confused with melanoma or which might lead to melanoma. We shall use the following outline:

I. BENIGN NEVI
- A. Congenital melanocytic nevi
- B. Acquired melanocytic nevi
  1. Junctional nevus
  2. Intradermal nevus
  3. Compound nevus
  4. Blue nevus
  5. Dysplastic nevus

II. MALIGNANT MELANOMA
- A. Pathogenesis
- B. Suspicious signs
- C. Diagnosis
- D. Types of melanoma
- E. Histologic examination
- F. Node dissection
- G. Adjuvant therapy
- H. Recurrences
- I. Prevention

I. BENIGN NEVI

A. CONGENITAL MELANOCYTIC NEVI

These melanocytic lesions, which are frequently present at birth, usually exceed one centimeter in diameter and are often much larger. It is currently debated whether the smaller lesions should be excised. The occurrence of malignant melanoma in the larger lesions (greater than 20 cm in diameter) is about six percent. Therefore, the larger lesions should clearly be excised. Many believe that the smaller lesions warrant excision as well.

B. ACQUIRED MELANOCYTIC NEVI

1. *Junctional nevi.* These lesions are not present at birth but are usually acquired in early childhood. They present as flat, circumscribed dark brown or black, evenly pigmented lesions usually measuring less than 0.5 cm in diameter. Microscopically, they consist of small nests of

* Address correspondence to Dr. Hagerty at 159 Rutledge Avenue, Charleston, S. C. 29403.

melanocytes at the dermal-epidermal junction.

2. *Intradermal nevi.* These lesions are less than 0.5 cm in diameter; dome-shaped or pedunculated; brown, tan, or skin-colored, and microscopically they consist of nests of nevus cells within the dermis.

3. *Compound nevi.* These tumors usually measure less than 0.5 cm in diameter, are dome-shaped, are brown, and microscopically consist both of nests of melanocytes at the dermal-epidermal junction and also of intradermal nests of nevus cells.

Although nests of intradermal nevus cells are frequently seen in conjunction with malignant melanoma, there is no clear evidence that malignant melanomas arise from either junctional, intradermal, or compound melanocytic nevi.

4. *Blue nevi.* So named because the dermal spindle-shaped melanocytes composing this tumor impart to it a blue color, this lesion is benign. On extremely rare occasions, it is thought that a variant, the cellular blue nevus, may become malignant.

5. *Dysplastic nevi.* In 1978, Clark and coworkers recognized families whose members had unusual melanocytic lesions and also developed malignant melanomas. Since that time, we have recognized the dysplastic nevus syndrome, which is seen in about six percent of the population and is frequently hereditary. These lesions often make their first appearance during the teenage years. They tend to be large (greater than 0.5 cm in diameter); have irregularly poorly circumscribed borders with splaying of pigment; to show irregular pigmentation which may be tan, brown, black, or red; and to have a flat periphery with a dome-shaped center.

Patients with the dysplastic nevus syndrome have a significantly increased incidence of melanoma. The current recommendation is that they should undergo excisional biopsy of one or two lesions for histologic confirmation of the diagnosis, and that they should subsequently be followed at six month intervals with photography to show clinical change. Lesions suspicious for melanoma should be excised.

II. MALIGNANT MELANOMA

A. PATHOGENESIS

Virtually all primary cutaneous malignant melanomas arise from pre-existing melanocytes in the epidermis. Melanocytes have the capability of manufacturing melanin, a dark brown to black pigment, and are diffusely distributed in the human skin. Blacks have about one-tenth as many malignant melanomas as whites,[3] and those that do occur are found in the least pigmented areas such as the palms of the hands, soles of the feet, nail beds, and mucous membranes. Among whites, fair-skinned persons have a significantly increased incidence of melanoma.

B. SUSPICIOUS SIGNS

Ninety-five percent of melanomas are darkly pigmented. Frequently there is a history of recent enlargement. Other suspicious signs include the following:

- variegation with shades of red, white and blue in brown or black lesions;
- an irregular border with an angular indentation or notch;
- an increase in size or color;
- irregular elevations of the surface; and
- scaling, oozing, crusting, bleeding, ulceration, itching, pain, and satellite pigmentations (all of which may be seen in the more advanced lesions).

Malignant melanomas may be simulated clinically not only by some melanocytic nevi but also by pigmented basal cell carcinomas, seborrheic keratoses, hemangiomas, thrombosed capillary aneurysms, pyogenic granulomas, and hemorrhages into the epidermis.

C. DIAGNOSIS

Excisional biopsy is preferable. A margin of normal-appearing skin should be obtained for optimum pathological examination. Although clinical signs may be suggestive, they do not establish a diagnosis of melanoma. Incisional, shave, or punch biopsies and frozen sections reduce both the accuracy of diagnosis and also the assessment of thickness.[4] If the lesion is too large to be excised in its entirety, the biopsy should include one lateral margin and the base at its thickest portion.

To facilitate our overall understanding of the spread of the neoplasm and for planning treatment, several stages of tumor extent have been described:

- Stage I: local disease
- Stage II: nodal disease (metastases to the regional nodes)

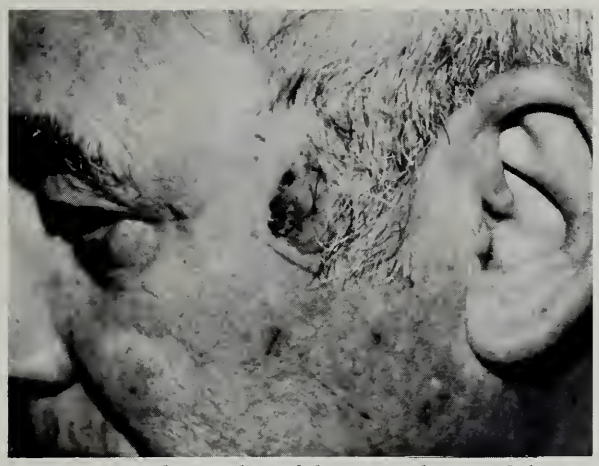


FIGURE 1A. White male with lentigo melanoma, left temporal area.



FIGURE 1B. Lentigo melanoma excised and defect closed with neck advancement flap.

- Stage III: disseminated disease (widespread metastases)

Since the clinical judgment of lymph node metastases may have a high rate of error and hematogenous spread may not be recognized for years, staging has its limitations.

D. TYPES OF MELANOMAS

1. *Superficial spreading melanoma* arises most frequently on the legs of women and on the trunks of men. Early surgical excision is usually curative.

2. *Lentigo malignant melanoma* characteristically arises on sun-exposed skin of persons over 60 years of age and is usually slow-growing (Figure 1A and B).

3. *Nodular melanoma* is characterized by rapid growth in depth and has a poor prognosis.

4. *Acral lentiginous melanoma*, the type most frequently seen in blacks, also occurs commonly in whites on the palms, soles, nail beds, and mucous membrances (Figure 2).

E. HISTOLOGIC EXAMINATION

As with most malignancies, size and extent of invasion influences prognosis. The extent of invasion can be evaluated histologically by the vertical measurement of tumor thickness in millimeters. Not surprisingly, the incidence of metastasis has been found to increase in direct proportion to the extent of invasion and thickness of the tumor.[5]

The suspicious lesion is excised preferably in its entirety with a margin of normal-appearing skin.[6]

Day et al. have recommended the following resection margins for malignant melanoma:

1. 1.5 cm of clinically normal skin for:
   (a) melanomas measuring less than 0.85 mm in thickness, regardless of location; and



FIGURE 2. Acral lentiginous melanoma, plantar surface of a black male.

(b) non-BANS (BANS is an acronym for Back, upper Arm, posterior Neck, and posterior Scalp) melanomas which measure 0.85 to 1.69 mm.

2. 3 cm of clinically normal skin for all other melanomas.

F. NODE DISSECTION

If node dissections were free of complications, then all patients with melanoma should undergo elective node dissection. In view of the high attendant morbidity, most commonly lymphedema, this surgery should be limited to those in whom the potential benefits outweigh the potential complications.

Lymph node dissection is recommended by most investigators in the presence of palpable lymph nodes and in the absence of evidence of disseminated disease. This is so despite the fact that data show a limited ability of such a procedure in the presence of gross nodal disease to influence the clinical course of the disease. In the majority of such cases disseminated metastases have already occurred. However, such surgery is helpful in obtaining local control of the disease and accurate prognostic information. The five year survival with negative nodes is about 75 percent, but with regional node metastasis, about 25 percent. The most common sites of distant metastases are the lymph nodes, skin, lung, liver, bone, brain and intestines.

In those patients with a primary malignant melanoma over 1.5 mm in thickness without palpable regional nodes, elective lymph node dissection is open to debate. The value of such a dissection is best determined by statistical studies of the survival rates of patients who have undergone the procedure and those who have not. One must consider the location of the primary neoplasm, the routes of lymphatic drainage, and most importantly, the thickness of the tumor. In reviewing the statistical analyses, it appears that prophylactic dissection is beneficial in primary lesions with a depth of invasion greater than 1.5 mm but less than 4 mm[7] (Figure 3, A & B). In the event of ambiguous lymphatic drainage, such as

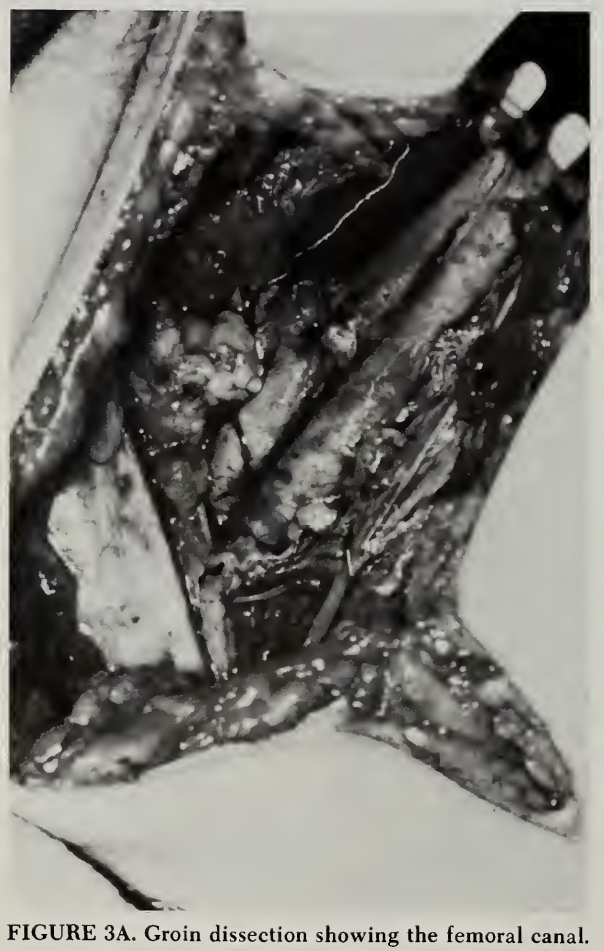


FIGURE 3A. Groin dissection showing the femoral canal.



FIGURE 3B. White male after superficial groin dissection.

in certain melanomas of the trunk, radionucleotide scans are helpful in determining the drainage patterns.

G. ADJUVANT THERAPY

Chemotherapy, immunotherapy, and radiotherapy have been employed in conjunction with surgery to prevent tumor recurrence or to control metastatic disease. Unfortunately, adjuvant therapy has not been demonstrated to be effective in the treatment of high risk malignant melanoma patients.

H. RECURRENCES

Wide local excision is indicated coupled with regional lymphadenectomy if those nodes are clinically involved. No patient with a malignant melanoma in the dermis can be assured of cure. There is need for lifelong followup. The metastases may remain occult for many years. One is reported 28 years following surgery of a primary skin neoplasm.

I. PREVENTION

Avoid exposure to the sun, especially between 10:00 a.m. and 3:00 p.m. when the ultraviolet rays are strongest. Also use protective clothing to include a broad-rimmed hat and number fifteen topical sunscreens. Routine examination is important, and essential at semiannual intervals in those with dysplastic nevus syndrome.

SUMMARY

Early diagnosis and treatment is the most effective means of decreasing mortality rates from this neoplasm. Early identification requires an alert patient, an aware physician, and a careful examination of the entire skin. The primary surgical extirpation is critical because we have not been able to significantly benefit those patients whose disease has extended beyond the local area. □

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The North Carolina and South Carolina Societies of Pathologists Joint Winter Meeting and Annual Shelley Memorial Lecture and Diagnostic Slide Seminar will be held at the Charlotte Memorial Hospital and Medical Center, Charlotte, North Carolina, on Saturday, February 1, 1986.

The guest lecturer will be Dr. Joseph Eggleston, Professor of Pathology and Director of Surgical Pathology at the Johns Hopkins Hospital, Baltimore, Maryland.

The title of the lecture is "In Search of Small Cell Carcinoma of the Lung" and will be presented at 10:00 a.m.

Afternoon Diagnostic Slide Seminar on lung lesions 2:00-5:00 p.m. Banquet at 7:00 p.m.

For further information, call Dr. Marie-Claire Marroum at 704-338-2251.

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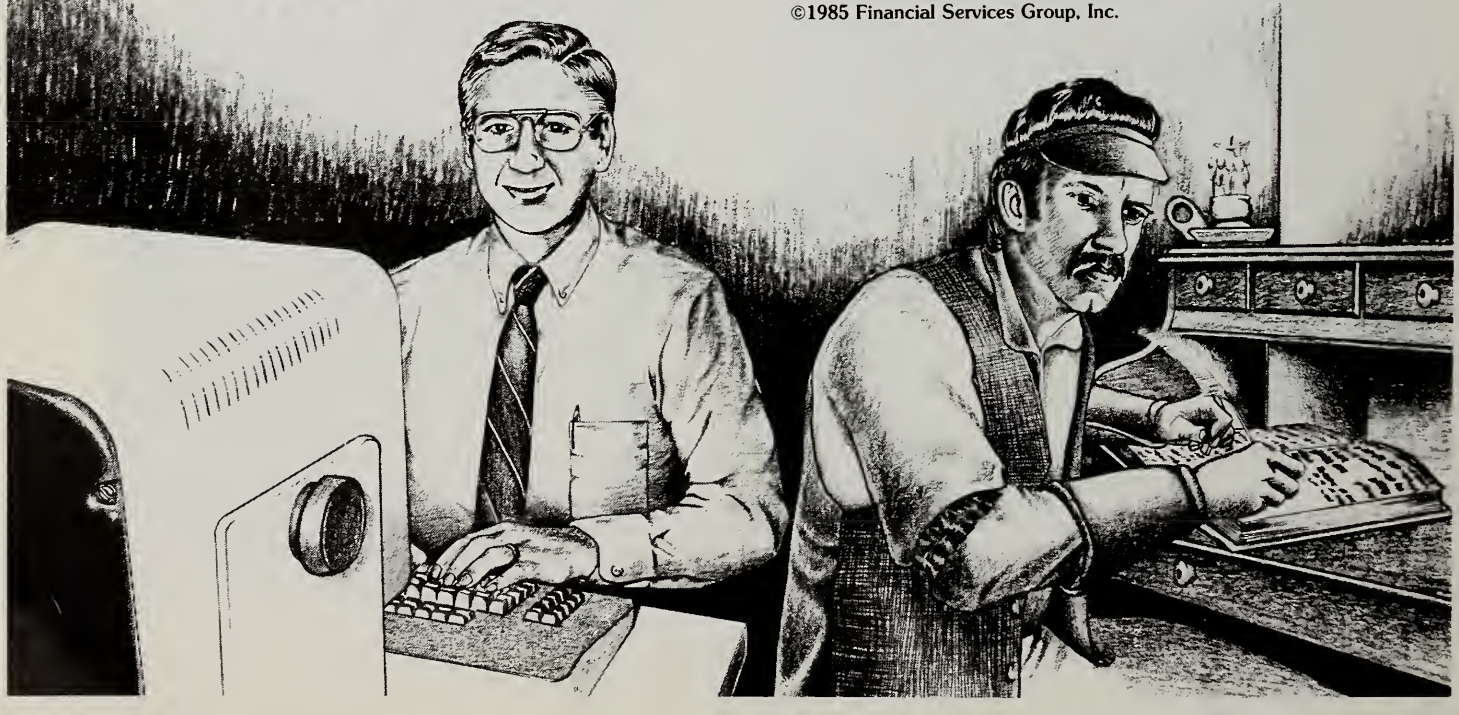
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IS IT AMYOTROPHIC LATERAL SCLEROSIS OR SOMETHING ELSE?

JOHN P. GALLAGHER, M.D.*

Amyotrophic lateral sclerosis (ALS) is a disease of the nervous system which causes a progressive degeneration of the anterior horn cells of the spinal cord, the fibers of the pyramidal tracts and terminally the nuclei in the medulla. The clinical picture is one of atrophy and fibrillations of the muscles of the extremities, particularly the uppers, and a progressive spastic paralysis of the lower limbs. The cause of the disease is unknown and there is no recognized treatment. Death occurs in three or four years from respiratory failure.

It does not seem to be widely known that an almost identical syndrome may occur with cervical spondylosis associated with extrusion of an intervertebral disc. These central disc protrusions often develop silently and when they have moved out of the interspace far enough begin to press against the underbelly of the cervical spinal cord. As a result, the neural structures within the cord including the anterior horns and the motor fibers of the pyramidal tracts become compromised. This can result in signs and symptoms of motor neurone disease indistinguishable from that seen in amyotrophic lateral sclerosis.

In this presentation attention is called to five examples wherein the patient was first thought to have ALS but was later shown to have cervical spondylosis with an extruded intervertebral disc lying against the cervical spinal cord.

CASE REPORTS

Case 1. T. W. was a 36-year-old male who complained of tingling of an index finger and thumb for the past year. In recent months he had begun to experience similar symptoms in the other hand as well as weakness and incoordination of both legs. On examination he showed numerous fasciculations of the muscles of the right shoulder and forearm and there was scattered atrophy of the muscles in those regions. The tendon reflexes in the upper limbs were normal but those in the lowers were hyperactive with bilateral ankle clonus and bilateral Babinski signs. There were no changes in sensation anywhere. Plain roentgen studies of the cervical spine showed minimal degenerative lipping of the lower cervical vertebrae. Myelography revealed a large defect in the dye column at the C^5 level. At operation, the spinal cord was found to be riding over a stony hard protrusion from the interspace, apparently a calcified cervical disc. The lesion was removed in several large chunks. Over the next twelve months the patient showed rapid improvement and was able to return to Europe to resume his duties as a CIA operative.

Case 2 was a 43-year-old male who complained of numbness of both arms and both index fingers for the past six months. Lately, he had begun to notice a weakness of both hands and had developed a staggering gait. On examination fasciculations of both forearms, weakness of both handgrips and early atrophy of the small muscles of both hands were seen. The reflexes in the upper limbs were normal but were hyperactive in both lowers with bilateral Babinski signs. There were no changes in sensation. Roentgen studies of the cervical spine showed minimal degenerative changes. Myelogram revealed a large defect at the C^5 interspace. At surgery, a densely calcified disc was found protruding from the interspace and pressing into the ventral part of the spinal cord. Because of the hardness of the lesion it could not be dislodged and accordingly the cord was decompressed by cutting the dentate ligaments. The patient showed rapid improvement and returned to his regular duties as a union official.

Case 3. W. M., a 44-year-old native of Hawaii, had experienced progressive weakness of the right hand and arm for the past nine months. He had noted also a weakness of both legs as well as a rippling of the muscles of the right leg. Numerous fasciculations were seen in the muscles of both shoulders and arms and he had a weakness of both quadriceps muscles. The tendon reflexes in all the extremities were hyperactive especially in the lowers. There were bilateral Babinski signs.

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Roentgenograms of the cervical spine showed lipping of the terminal plates at C^4, C^5 and C^6. Myelography showed defects in the dye column at all three levels. At operation, rocklike disc protrusions were found at those interspaces with the maximum protrusion at C^4. The spinal cord was found to be indented and elevated over each protrusion. It was found to be impossible to remove any of these lesions and the cord was decompressed by cutting the dentate ligaments. This patient was under observation for a year and showed no improvement.

Case 4. D. F. was a 50-year-old male who complained of increasing weakness of both upper limbs as well as the left lower limb for the past two years. On examination he showed atrophy and fasciculations of the muscles of both arms and shoulders and weakness of both quadriceps. All of the tendon reflexes in the extremities were hyperactive especially in the lowers. Plain roentgen studies of the cervical spine showed marked lipping of the cervical vertebrae at C^3, C^4 and C^5 levels. Although the consensus was that he probably had ALS, a myelogram was carried out. The myelogram showed large defects at the aforementioned vertebral levels. At surgery, calcified disc extrusions were found at all three levels and were so densely invaded with calcium that they could not be removed. To relieve the pressures on the spinal cord multiple dentate ligaments were sectioned. This patient showed no improvement after surgery.

Case 5. W. J. B. was a 57-year-old black male who had noted a progressive weakness of the right arm and leg for the past two years. He showed atrophy of the muscles of the right shoulder girdle with numerous and widespread fasciculations of the involved muscles. There was a Babinski sign on the right. Roentgen studies of the cervical spine as well as a myelographic study were reported as normal. When seen again three years later he exhibited a marked advance in the muscle signs and now both shoulder girdles and both upper limbs were extensively involved. The myelogram was repeated and this time large defects in the dye column at the C^5, C^6 and C^7 levels were found. At operation, the spinal cord was seen to be severely compressed from below by the extrusions at each of those interspaces. Because of the intense hardness of each disc none of them could be removed and the cord was decompressed by cutting the corresponding dentate ligaments. This man was under observation for one year and exhibited only limited improvement.

DISCUSSION

Over the past 35 years, a number of authors have described similar examples of what at first seemed to be amyotrophic lateral sclerosis but later turned out to be cases of spinal cord compression from cervical spondylosis associated with hardened extruded intervertebral discs. One of the earliest reports was the one by Kahn[1] who stressed the role of the dentates in tying the cord down against the protruding lesion resulting in damage to the neural elements inside the cord. Brain *et al*[2] in a postmortem study of 45 subjects with cervical spondylosis mentioned that some of them during life had been diagnosed as suffering from ALS. Liversedge and his coworkers[3] reported four other patients with spondylosis presenting with syndromes identical to that seen in ALS. More recently, Keplinger[4] added another example of cervical spondylosis imitating ALS.

Very little is known about the origin of these spondylotic lesions. The detailed postmortem studies by Payne and Spillane[5] have given no clue to how they start or why they keep growing as they continue to build up layers of calcium around them. During their autopsy studies these investigators often found that to completely remove these protrusions from the interspace it required the use of a hammer and chisel (Fig. 1). This gives some indication of the difficulties that are often met in trying to remove them at surgery. The



FIGURE 1. Large spondylotic bar lying on floor of cervical spinal canal.

same investigators finally concluded that these extrusions actually were degenerated intervertebral discs that had moved out of their interspaces and became invaded with dense layers of calcium salts.

As these spondylotic bars move slowly out of the interspace and begin to press against the overlying spinal cord, the signs and symptoms of motor neurone disease start to appear. The clinical course is slow, and unlike those with true ALS, these patients may live on for long periods of time with their disorder. As might be expected, patients with spondylosis and cord compression do not develop difficulties with speech and swallowing as do their counterparts with ALS.

Patients with spondylosis rarely complain of neck pain. Passive movements of the cervical spine are not painful or restricted. Most of the patients are men in their forties or fifties and many have a history of having engaged in manual work in their earlier years. A history of a direct trauma to the neck is usually absent.

On examination, in addition to their neurologic signs, these patients often have a tendency to carry their head forward on the chest in buffalo fashion. Many have a strong muscular build.

Roentgen views of the cervical spine usually show varying degrees of degenerative changes in the vertebrae. Spinal fluid studies generally are normal giving no clue to the presence of a protrusion in the spinal canal. The spondylotic lesion is best identified by myelographic studies or by CAT scan views.

Two of the patients reported here recovered sufficiently from their neurologic disorder to return to their regular occupations while in a third patient only partial relief of symptoms followed surgery. The lack of improvement in the other two patients probably was the result of delay in recognition of the real trouble thus permitting irreversible damage to the spinal cord.

Over the years the standard treatment for these difficult lesions has been to expose them posteriorly with the removal of several laminae. All of the patients described here were treated by this approach. The disadvantage of exposing the lesion posteriorly is that an already ailing cord must be manipulated to expose the extrusion beneath it. The advantage of the posterior approach is that if the disc cannot be dislodged then the cord can be released from its fixed position against the bulging lesion by cutting the dentate ligaments. In recent years some surgeons have elected to approach these lesions by an anterior exposure of the cervical spine. However, this approach involves manipulation and retraction of several soft structures such as the esophagus and larynx. By an anterior exposure the hardened disc can be drilled out of the interspace rather quickly. But there is some element of danger to this type of operation since the vibrations of the surgical drill could cause further damage to a cord already suffering from the effects of chronic compression.

SUMMARY

It is evident that not every patient presenting with fasciculations and atrophy of the muscles along with spasticity of the lower extremities has ALS. In some cases the clinical picture may be the result of compression of the cervical spinal cord from spondylosis and an extruded intervertebral disc. Since the latter is potentially reversible and the former is not it becomes mandatory to identify one from the other. Neurologic examination alone



FIGURE 2. Partial blockage of dye column in myelogram of patient with cervical spondylosis.

is not sufficient to do this nor can electrophysiologic testing of the affected muscles and nerve trunks distinguish between the two. It is only by careful myelographic studies of the spinal canal (Fig. 2) or by CAT scan views can one identify amyotrophic lateral sclerosis from cervical spondylosis. □

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THE SOUTH CAROLINA MEDICAL ASSOCIATION AND THE STATE BOARD OF MEDICAL EXAMINERS: AN HISTORICAL PERSPECTIVE

SAMUEL L. BAKER, PH.D.*

On May 15, 1985, the South Carolina State Legislature changed the method by which the physician members of the State Board of Medical Examiners are chosen. Prior to 1981, the South Carolina Medical Association (SCMA) nominated physicians to serve on this board, which licenses physicians and osteopaths. The governor appointed from the medical association's nominees. Between 1981 and 1985, an election conducted by the SCMA was statutorily required.

The new law removes the medical association entirely from the selection process. The governor directly appoints one of the board's physicians. Seven physicians will be elected by the state's licensed physicians, one board member from each of the six congressional districts and one at large. Rounding out the ten-member board will be one lay person, appointed by the governor, and one osteopathic physician, elected by the state's osteopathic physicians at large.

This change was the legislature's quick response to an April 22, 1985, decision of the South Carolina Supreme Court declaring the former method of choosing the board unconstitutional because it delegated the governor's appointment power to a private body, the state medical association.[1] The new method gives control over most of the board to the physicians themselves, rather than to their organization.

How did the SCMA acquire its ill-fated role as nominator of the board that licenses physicians? The answer lies in the history of physician licensure in the United States.

Physician licensure in South Carolina dates from 1817, when the legislature established two boards of medical examiners, one at Charleston and one at Columbia. The Charleston board was the Medical Society of South Carolina. Anyone newly entering medical practice without the board's approval was subject to fine and imprisonment and could not sue to collect patient fees.[2]

Such a law was fairly typical of its time. Many of the young states established physician licensure. Often, as here, they designated the state medical association as the board to review credentials and conduct examinations.[3] It was then common in the United States, as in Britain, to establish or authorize private corporations to carry out public purposes.

Physician licensure in the United States crumbled in the 1830's and 1840's. This was the era of Jacksonian Democracy, of general revolt against state-sponsored privilege. This was also a time of particular revolt against the regular medical profession's harsh therapeutics of bleeding, blistering, and purging.[4] From within the medical profession there arose homeopaths, whose "dynamism through dilution" theory led them to dose their patients with harmless glasses of water. Outside the medical profession there were several popular health movements, one of the strongest of which was Thomsonian vegetable medicine.[5]

Licensure laws that interfered with the alternative practitioners fell in state after state. Medical association efforts to enforce the law against those they regarded as quacks only accelerated the undoing of licensure. In South Carolina in 1835, for example, the state medical society sought to prosecute four Thomsonians for unlicensed practice of medicine, but the grand jury would not indict. Three years later the legislature repealed all punishment for unlicensed practice.[6] By the 1850's medical practice in the United States was virtually wide open.

With free entry, medical sects flourished. The two strongest rival sects were the homeopaths and the eclectics. Each established state medical societies, hospitals, and medical schools. Homeopaths, who enjoyed the patronage of the wealthy and influential, established 22 medical schools. Their legacy includes teaching hospitals in Boston and Philadelphia named after homeopathy's

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founder, Samuel Hahnemann. Homeopaths were most plentiful in northern cities, where they constituted perhaps 10 percent of the physicians. In Charleston, S. C., in 1869 there were two homeopaths among the 84 physicians and surgeons listed in the city directory.[7]

Eclectics were the successors to Thomsonianism. They tended to be less well-connected than the homeopaths and less interested in modeling themselves after the regular medical profession. Though no eclectics were listed in the 1869 Charleston directory, eclectics were generally more plentiful than homeopaths in the South.[8]

Physician licensure revived gradually in the last decades of the nineteenth century. South Carolina was the first state to permanently reestablish statewide licensure, in 1869. The last state to do so was Massachusetts in 1894.[9]

The growth of the organized sects hamstrung efforts to reenact physician licensure in most states. Legislatures generally framed licensure laws so that they would not discriminate against the sects. Consequently, regular medical societies did not always support medical licensure. Some regulars argued that it would be better to continue with no licensure than to give the sanction of the state license to homeopaths and eclectics.[10]

The simplest way to achieve non-discrimination was to license all medical school graduates. South Carolina's 1869 law did this, as did most licensure laws of the 1870's. These laws had the serious disadvantage of encouraging the proliferation of low quality medical schools.

In the late 1870's and 1880's the states began to establish boards that reviewed prospective physicians' medical diplomas for the quality of the issuing school and administered examinations if required. South Carolina in 1881 assigned these duties to the county boards of health. An 1887 law established a state board of medical examiners, whose five members, all practicing physicians, were appointed by the governor. In 1890 the county boards were revived. Then, in 1893, the legislature reversed itself again and established a seven member state board of medical examiners, composed of physicians appointed by the governor.[11]

Most other states, as they established medical examining boards, made provision for the homeopaths and eclectics. In the 1890's, Georgia and Pennsylvania, among others, had three separate boards, one for regulars, one for homeopaths, and one for eclectics. After 1900, many states, including Georgia and Pennsylvania, adopted a single board whose membership was apportioned among the sects according to a representation scheme that tended to favor the smaller sects. Both multiple-board and single-board systems required the governor to make appointments from nominees submitted by the state regular, homeopathic, and eclectic medical societies.

In South Carolina, the homeopaths and eclectics did not achieve the numbers, organization, or influence that they had in most states, including neighboring Georgia. The SCMA had no rival as the prominent statewide source of medical expertise. It is indicative that in 1878 the SCMA itself, plus the state attorney general and comptroller general, had been designated as the State Board of Health.

In 1897, the legislature similarly turned to the SCMA to help constitute the medical examining board, by specifying that the board would be "elected by the State Medical Association, and thereupon commissioned by the Governor."[12] South Carolina thus adopted a nomination and appointment mechanism used in other states to guarantee sect representation, but here only the regulars could nominate.

The year 1900 saw a short-lived revolt against this arrangement. An amendment restored direct appointment to the governor, though the actual membership or functioning of the board does not seem to have been affected. Another 1900 amendment established a separate governor-appointed State Board of Homeopathic Medical Examiners.[13]

In 1904, the legislature reversed itself yet again and restored the medical association's role, giving the board the basic form that it was to keep until 1985. The State Board of Medical Examiners came to consist of eight physicians, one from each of the seven congressional districts and one at large, all nominated by the state medical association and appointed by the governor. The governor could reject nominees only for specific unfitness. Osteopaths received their first mention in 1904: they were exempted from examination, but were required to submit their diplomas to the board for approval. In 1908, licensure of homeopaths and osteopaths was centralized under the regular state board, eliminating the homeopaths' board and the osteopaths' exemption. Board examinations for homeopaths and osteopaths excluded materia

medica and therapeutics, a typical device of the time to accommodate sects. Reference to homeopathy was later dropped. Osteopaths achieved full equality, including a member on the board, only in 1969.[14]

CONCLUSION

The SCMA's historic involvement with the Board of Medical Examiners was rooted in the conditions of the late nineteenth century, when physician licensure was revived in the United States. Other states had similar laws, so framed to accommodate the homeopaths and eclectics. In South Carolina, however, homeopaths and eclectics were few and unorganized. The standard licensure formula, applied to South Carolina, produced a law that singled out the SCMA. The specification of the one osteopathic member of the board is the last survival of the old sect conflicts. □

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HEALTH RISK BEHAVIORS IN ADULT SOUTH CAROLINIANS*

MARIA T. WHITEHEAD, M.P.H.
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DANIEL T. LACKLAND, M.S.P.H.

Many major health problems confronting Americans today are linked to lifestyle risk factors or personal choice behaviors. To develop effective health promotion and disease prevention programs in South Carolina, it is important to document the frequency and extent of health risk behaviors among the population. To meet this need, the S. C. Department of Health and Environmental Control initiated in 1984 a Behavioral Risk Factor Surveillance Program to monitor the prevalence of major behavioral risk factors in the state.

The surveillance system is based on an ongoing statewide telephone survey which has been in operation since January 1984. Survey respondents are adults, age 18 and over, selected through a random digit dialing procedure. There were 796 interviews completed in 1984, for an 86 percent response rate. A 36-item questionnaire developed by the Centers for Disease Control is utilized. Data are collected on health risk behaviors, age, sex, race, educational level and height and weight of respondents. Specific attention is given to eight health risks: lack of seat belt use, cigarette smoking, obesity, sedentary lifestyle, uncontrolled hypertension, drinking and driving, and acute heavy drinking and chronic heavy drinking. Preliminary results for 1984, as well as comments on each of these items, are summarized below:

CIGARETTE SMOKING

- 26 percent of adult South Carolinians were smokers in 1984 (approximately 561,000 individuals).
- Cigarette smokers have a 70 percent higher mortality rate than nonsmokers.[1, 2]
- A national objective is to reduce the proportion of adults who smoke to below 25 percent by 1990.[3]

OBESITY

- 22 percent of adult South Carolinians (approximately 475,000 individuals) were 120 percent or more of ideal weight.
- Obese individuals have higher risks of hypertension, diabetes, coronary heart disease, accidents and certain cancers.[4]
- A national objective is to decrease the prevalence of significant overweight (120 percent or more of ideal weight) among the U. S. adult population to 10 percent of men and 17 percent of women, without nutritional impairment, by 1990.[3]

LACK OF SEAT BELT USE

- 67 percent of adult South Carolinians do not wear seat belts regularly (approximately 1,446,000 individuals).
- 50 percent of automobile-related deaths and injuries could be prevented if seat belts were used.[5]
- Although there is no national objective for increased seatbelt use, research on motor vehicle crash injuries has shown that the automobile safety belt is the most effective item available to reduce the number of traffic injuries and deaths.[6]

SEDENTARY LIFESTYLE

- 52 percent of adult South Carolinians (approximately 1,122,000 individuals) were classified as "sedentary," or have irregular activity.
- Benefits of regular exercise include loss of excess fat, decreased anxiety, an increased sense of well being, improved cardiopulmonary efficiency, and more high-density lipoproteins.[7]
- A national objective is that the proportion of adults ages 18 to 65 participating in vigorous

* From the Division of Chronic Disease, South Carolina Department of Health and Environmental Control, 2600 Bull Street, Columbia, S. C. 29201 (address correspondence to Ms. Whitehead).

physical exercise should be greater than 60 percent by 1990.[3]

ALCOHOL ABUSE

- 11 percent of adult South Carolinians (approximately 237,000 individuals) were classified as acute heavy drinkers, reporting five or more drinks on at least one occasion in the past month.
- Seven percent of adult South Carolinians (approximately 151,000 individuals) averaged 60 or more drinks in the past month and were classified as chronic heavy drinkers.
- Two percent of adult South Carolinians (approximately 43,000 individuals in any given month) reported driving an automobile after having had too much to drink.
- Alcohol abuse is a factor in over 10 percent of all deaths and an ill-defined proportion of injuries. It is clinically associated with fetal alcohol syndrome, heart disease, cirrhosis of the liver and cancers of the oral cavity, esophagus, pharynx and liver. Excessive use of alcohol is involved in at least half of all traffic fatalities and 60 percent of all violent crimes.[2]
- A national objective is that the proportion of problem drinkers among adults age 18 and over should be reduced to eight percent by 1990.[3]

UNCONTROLLED HYPERTENSION

- 18 percent of adult South Carolinians (approximately 388,000 individuals) reported that they had been told they had hypertension; two percent of the adult population (approximately 43,000 individuals) had uncontrolled hypertension.
- Hypertension is the largest single contributor to stroke and a major contributor to heart disease and kidney failure.[8]
- A national objective is that at least 60 percent of the estimated population having definite high blood pressure ($\geqslant$ 160/95 mm Hg) should have attained successful long-term blood pressure control, i.e., a blood pressure at or below 140 mm Hg for two or more years, by 1990.[3]

The Behavioral Risk Factor Surveillance Program is an important factor in preventive health care for South Carolinians, as it provides a baseline against which future efforts toward change can be measured. Changing behavior is never easy, but neither is it impossible. It is difficult to change behavior of patients unless health professionals are committed to the benefits and necessity of change. We may have become masters of "high technology in health care," but our challenge is to revive some of the "high touch" practices such as the art of counseling patients and families. The practitioner's role in these health promotion activities is a key one. □

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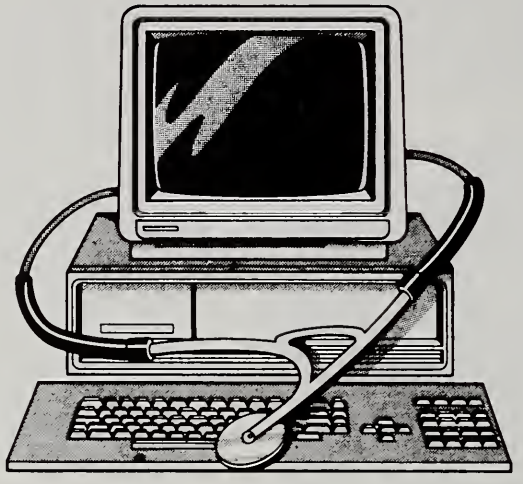
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SCMA NEWSLETTER

January, 1986

* LATE BULLETINS *

MEDICARE FEE FREEZE

Remaining deadlocked on several issues, Congress, on Friday, December 20, once again failed to reach agreement on the long-stymied budget reconciliation process and adjourned sine die until Tuesday, January 21.

Before doing so, however, it took emergency action extending the Medicare reimbursement freeze until Monday, March 14.

The Medicare reimbursement freeze on participating physicians and the fee freeze on non-participating physicians continue to be in effect until at least March 14 unless Congress completes the budget reconciliation process and substitutes other Medicare limits before then.

ST. PAUL ISSUES MORATORIUM

SCMA Headquarters has learned that in a letter dated December 19, 1985, the St. Paul Insurance Companies wrote Insurance Commissioners throughout the country, notifying them that St. Paul is imposing a temporary countrywide moratorium on the acceptance of most new classes of health care provider liability. The moratorium was effective January 1, 1986.

St. Paul has stated that until their combined ratio results improve, it would be imprudent to compound their problems via an expanding book. This action applies to new business only, not existing accounts. The moratorium also does not apply to collateral lines, additions to existing accounts, purchase of additional limits or umbrella/excess policies and agent-of-record transfers. Nursing home liability, non-traditional accounts and certain associations where St. Paul is the endorsed carrier are also exempt.

In addition, St. Paul has advised Insurance Commissioners that controlling new business at this time will allow them to continue renewing accounts and position them to accept new business in the most effective manner at a later date. They are presently seeking solutions to the problems they face -- solutions such as expanded risk management efforts to prevent the incidence of malpractice, aggressive claims handling strategies to minimize its impact once it does occur, development of better insurance products and services for a changing health care marketplace and cooperation with those searching for creative alternatives equitable to all stakeholders.

TORT REFORM ACTIVITIES

Monies received from the voluntary assessment for tort reform are being used to implement a public awareness campaign throughout the state to educate South Carolinians on the professional liability crisis -- a crisis further intensified by St. Paul Insurance Companies' recent moratorium (see story, page one).

Results of the SCMA physician survey conducted this past fall were announced at a press conference in Columbia in mid-December. SCMA President, *J. Gavin Appleby, M. D.*, and Executive Vice President, *William Mahon*, stated to members of the media that, of the physicians responding to the survey, 54 percent have had to increase fees as a direct result of liability cost increases. Additionally, 40 percent of those responding have been forced to curtail services due to the same reasons.

During the press conference, the formation of the S. C. medical poll was also announced. Developed and implemented by Metromark, the telephone survey will be conducted several times throughout the campaign to determine the attitudes and knowledge of South Carolinians toward the professional liability situation and its effect on their health care. Results of the first telephone survey in late December revealed some significant facts, among which are

--- Over three-fourths of respondents say they would support a change in the law to limit the amount of money a lawyer can receive in medical malpractice cases, and over sixty percent say they agree with the statement that "there ought to be a limit on what people who sue doctors can collect."

--- Nearly half (48.8%) say most suits are <u>not</u> justified. Under a third say most malpractice suits are justified, and just under 20 percent say they don't know one way or another.

--- Two-thirds of respondents say they agree with the statement that "it's the lawyers who stand to gain the most in medical malpractice suits."

--- Over half of respondents say they disagree with the statement that "doctors make more mistakes in treating patients today than they did ten years ago."

--- An overwhelming 84 percent of respondents agree that "the more a doctor has to pay for malpractice insurance, the more the doctor has to charge for services."

--- Eighty percent say they agree that "there is a growing crisis with medical malpractice suits and awards in this country." However, just under 60 percent agree that "there is a growing crisis with medical malpractice in <u>South Carolina</u>.

--- Over 30 percent say they don't know when asked whether they agree that "doctors in South Carolina are paying too much for malpractice insurance." Any issue which shows over 15 percentage points "don't know" is one which the SCMA should address in its public education efforts.

SCMA leaders have been or will be seen on television talk shows in Columbia, Charleston, Greenville, Spartanburg and Florence. Press releases continue to be mailed to the state's newspapers, and civic and business organizations are being contacted to schedule speaking appearances by SCMA spokesmen.

FOUNDATION BIDS FOR PRO CONTRACT

As this *Newsletter* goes to press, the South Carolina Medical Care Foundation is preparing a bid in response to a request for proposals which HCFA released to reinstate the PRO contract in South Carolina.

It is also our understanding that a competitive bid will be submitted by Blue Cross of South Carolina (according to their letter of December 26, 1985 to South Carolina physicians from Dr. Hartvigsen).

ARTHRITIS FOUNDATION THIRD ANNUAL SYMPOSIUM

The S. C. Chapter of the Arthritis Foundation is sponsoring its Third Annual Symposium on the topic of *"Rheumatology and Sports/Industrial Medicine,"* on Thursday, February 20, 1986 at the Columbia Marriott Hotel in downtown Columbia. Guest speakers include *Glen A. Gordon, M. D., Medical Director, Puget Sound Institute for Industry and Sports; Robert A. Turner, M. D., Chief, Section on Rheumatology at Bowman Gray School of Medicine; Robert E. Boyd, M. D., Rheumatologist, Columbia Arthritis Center;* and *Deborah S. Litman, M. D., Rheumatologist, Columbia.* The program qualifies for six credit hours in Category I of the AMA Physician's Recognition Award.

Registration fee is $25.00 which includes luncheon. For additional information, contact the S. C. Chapter of the Arthritis Foundation, 1802 Sumter Street, Columbia 29201.

RISK MANAGEMENT SEMINAR: PROFESSIONAL LIABILITY - WHAT'S NEXT?

As reported in last month's *Newsletter*, the SCMA Risk Management Subcommittee under the Chairmanship of *Euta M. Colvin, M. D.*, has arranged a Risk Management Seminar, to be held Wednesday, February 5, 1986 at the Sheraton Northwest in Columbia. There is no registration fee, but the cost for a "Dutch Treat" luncheon will be $9.00 payable at the door. Guest speakers include *Adam P. Wilczek, Vice President of Risk Prevention for the Medical Inter-Insurance Exchange of New Jersey; James S. Todd, M. D., Senior Deputy Executive Vice President of the American Medical Association;* and *James Lewis Griffith, Esq., partner in the Philadelphia law firm of Griffith and Burr.*

The afternoon's program will feature *Stephen Seeling of the S. C. Attorney General's Office; Jeter Rhodes, S. C. Defense Attorney; Douglas Crane, M. D., Chairman of the SCMA's Committee on Alcohol, Drug Abuse and Impaired Physicians;* and *Mr. Carlton Truax, S. C. Insurance News Service.* *Mrs. J. D. (Margaret Ann) Ashmore* will be the luncheon speaker. Of special interest will be an update on the SCMA's tort reform activities, and a question and answer session entitled "What you Always Wanted to Know about Professional Liability and Were Afraid to Ask."

If you plan to attend, return the postage paid reply card mailed to you in early January from SCMA Headquarters.

CRIME VICTIMS' COMPENSATION FUND

In accordance with Section 16-3-1210 (2), the Crime Victims' Compensation Fund will make payment for a routine medicolegal examination of alleged victims of criminal sexual conduct in any degree or child sexual abuse cases provided the victim has filed an incident report with the police, and provided the health care facility has performed the examination adhering to sexual assault examination protocol standards developed by the South Carolina Law Enforcement Division and the South Carolina Hospital Association. This crime must have occurred in South Carolina. This fund will not make payment for additional procedures such as x-rays, surgery, hospital admission, follow-up counseling or examinations. However, the victims may submit a claim for reimbursement through normal procedures with the Crime Victims' Compensation Fund.

Health care facilities throughout the state should have received the sexual assault examination kits and the Crime Victims' Compensation Fund Medical Examination Release Forms. The Crime Victims' Compensation Fund will make payment to health care providers and facilities on a monthly basis. In the event a large number of cases are submitted from a particular hospital for payment, one check will be paid with a list of citims' covered by same.

For additional information, contact *Ms. Sandra J. Ashmore at 758-6420, and see the August, 1985 issue of this Newsletter.*

GROWING...GROWING...GROWING

On the last day of 1985, the SCMA had 88 more members for the new membership year (1986) than it had in the previous record-setting year. "Physicians now understand that a unified profession offers the best hope to help resolve the critical issues facing health care today," said *J. Gavin Appleby, SCMA President.*

Last year's membership increased about seven percent and it is hoped that percentage figure can be improved in the 1986 membership year.

Thus far, the voluntary contributions to political action (SOCPAC/AMPAC) reflect a net increase of more than 200 over the similar period last year, demonstrating real physician interest in the important political arena.

You can be a part of this resurgence by asking a non-member colleague to become a part of the growing SCMA team -- with unity comes strength!

CONGRATULATIONS, SCMA EXECUTIVE DIRECTOR!

The AMA Council on Ethical and Judicial Affairs has recommended, and the AMA House of Delegates has accepted as an Affiliate Member, the SCMA Executive Director, *William L. Watson.* Mr. Watson was recommended for AMA Affiliate Membership Status as an "individual who has attained distinction in his field of endeavor."

HEALTH CARE FOR THE MEDICALLY INDIGENT: A JOINT EFFORT

WILLIAM H. HESTER, M.D.*
AMANDA H. COLEBURN, Dr.P.H.*

In June, 1982, the SCMA Council (now Board of Trustees) developed an *ad hoc* Medicaid and Indigent Care committee. At the time of its formation, relationships between physicians and Medicaid were deteriorating. It was a time of economic recession; federal support to the medically indigent was cut by 26 percent; and Medicaid's reimbursement rates and income eligibility limits were lower than surrounding states. The population in need was increasing while resources were decreasing. In view of these events the committee was directed to define systematically the problems and postulate effective resolutions.

The specific goals of the *ad hoc* committee were to improve communications between physicians and the Department of Social Services (D.S.S.), to increase physician input into decisions made by D.S.S., and to work with D.S.S. to expand their system to reach more people. Other goals included studying health care delivery systems, funding support, and eligibility criteria.

Three categories of indigency were defined by the committee. These were the marginally employed, the newly unemployed, and the Medicaid recipient. The marginally employed were those individuals who had employment but whose income was too high for Medicaid assistance and too low to pay for health care. Their number was estimated to be 50,000. The newly unemployed were those who had lost their jobs because of economic recession. They had no income and no insurance but had assets which made them ineligible for assistance. This population numbered about 150,000. The Medicaid recipients made up the largest group and numbered approximately 225,000 persons. These were the people who comprised 18 percent of the physician's office practice and 23 percent of his/her hospital practice.

In its first year the committee developed and held joint workshops involving physicians, their office staff, and Medicaid representatives. Public awareness programs were developed to describe the benefits and limitations of the Medicaid program. The SCMA also conducted programs to increase physicians' awareness of the medically indigent problem and improve communication between health care providers and funding resources.

In 1982 the committee drafted a proposal to pool state and county allocations for indigent health care. This would provide a greater amount of money to be matched with federal dollars. It would also mean that counties whose revenues were low would receive equitable health care funds. In 1985, this proposal became a part of the Medically Indigent Assistance Act.

In April, 1983, the SCMA House of Delegates changed the *ad hoc* committee to a standing committee. The standing committee conducted a survey of the state's physicians to specifically describe the scope of indigent care. Responses were received from 1,100 of the 3,000 to whom surveys were mailed. The results were:

(1) Care for the medically indigent was rated as one of the highest priorities to be addressed by the profession and the Association.
(2) 40 percent of the responding physicians indicated that in addition to the care they provided in their offices and the hospital they also provided care to indigent patients in nursing homes, patient's private homes, public health clinics, and cooperative free health care clinics.
(3) Daily, 17,000 office visits were to serve the medically indigent. These visits represented approximately 60 million dollars annually.

The committee also studied funding resources' guidelines and reimbursement rates. Specific problems defined were inadequate reimbursement schedules, reduced coverage for hospitalization, and limited eligibility criteria. Physicians

* McLeod Regional Medical Center, 555 E. Cheves Street, Florence, S. C. 29501. Address reprint requests to Dr. Hester.

were not participating in the Medicaid program because of its restrictions. These findings resulted in negotiation with D.S.S. to increase financial support. These negotiations led to an increase in Medicaid reimbursement for office visits to $12.00.

Following the reimbursement increase the committee implemented a widespread campaign. As a result of combined efforts of physicians, Medicaid, and state government, the number of physician groups participating in the Medicaid program increased by 220 in a six-month period. Additional results of this change in funding included a three percent reduction in Emergency Room visits and an eight percent increase in office visits.

In the first session of the 1985 legislature the Medically Indigent Assistance Act was passed. This act provides funds to expand services in hospitals and offices. It also allows for coverage of services designed to promote health and preserve wellness. Health care is assured to all state residents regardless of their ability to pay or county of residence. This increases accessibility to health care.

This Act represents the culmination of efforts of a professional group (SCMA), a governmental agency (Medicaid, Health and Human Services), and the state's elected lawmakers. The Medically Indigent Assistance Act represents the philosophical tenet of the Committee that health care for the medically indigent is the responsibility of all. □

ACKNOWLEDGMENT

The authors express appreciation to Richard R. Howell, M.D., for his assistance in reviewing the manuscript.

REFERENCES

1. Statement of the South Carolina Medical Association on *Care of the Indigent in South Carolina.*
2. Reports of the *ad hoc* and standing Committee on Medicaid and Indigent Care, SCMA.
3. *Physicians and Public Attitude on Health Care Issues,* American Medical Association, 1984.

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Editorial

THE NEW BOARD — A RETROSPECTIVE

In this issue of The Journal, *Dr. Samuel Baker provides an historical perspective on the relationship between the SCMA and the State Board of Medical Examiners. Dr. Baker's objective review supports last year's assertions that the SCMA never sought to control the State Board of Medical Examiners. Instead, government logically looked to the SCMA to provide leadership, since the SCMA had assumed the pivotal role in fostering scientific, ethical medicine in our state. In the editorial below, Dr. Ernest Lathem retraces the events since April 22, 1985, when the Supreme Court deemed the previous makeup of the Board to be unconstitutional.*

— CSB

On April 22, 1985, the Supreme Court opinion was rendered that the South Carolina Board of Medical Examiners was unconstitutionally composed. The Board was thus declared powerless by the State Attorney General.

Fortunately, the decision came on Monday the week of the Annual Meeting of the South Carolina Medical Association. Through joint efforts of the trustees and officers (then Council) of the Medical Association and the Board, a plan for new legislation was formulated. The proposed legislation was introduced, rapidly passed, and signed into law by Governor Riley.

The new statute authorized the Governor to appoint an Interim Board to serve until a new Board could be elected. The Governor named the former members of the Board (that the court declared unconstitutional) to serve on the Interim Board. This Interim Board was directed to hold elections as provided in the new legislation.

The election process provided for nominations by petition with any licensed physician being eligible to nominate (by petition) or serve. There was widespread interest and in some districts over 80 percent of the licensed physicians participated in the voting process. Several run-off elections were necessary. New Medical Disciplinary Commission members were also elected.

The new members of the Board and Disciplinary Commission were elected to staggered terms to provide continuity of service. Elections (with the same procedure for nominations and voting) will be held each year to fill the seat of those whose terms have expired. In addition, the Governor may appoint one lay member and one physician to the Board.

The new Board has met, organized and is actively engaged in its ongoing business. As president of the Board, I can state unequivocally that the board investigates every initial complaint we receive in a thorough and unbiased manner. In cases where incompetent treatment is alleged, the allegation is evaluated by an independent physician(s). By law all final disciplinary orders of the Board (other than private reprimand or dismissal of the alleged charge) are public records and available under the Freedom of Information Act.

The South Carolina Board of Medical Examiners is absolutely committed to protecting the public and working to ensure high quality medical care for all our citizens. There is simply no merit to the suggestion that there are known "bad doctors," whose misconduct is supported by admissable evidence, being permitted to practice in South Carolina.

The March 21, 1985 issue of *The New England Journal of Medicine* reviewed the activities of state medical boards. This review noted the 4.4 disciplinary actions per 1,000 licensed physicians in South Carolina. The South Carolina Board of Medical Examiners was the eighth most effective in the nation.

J. Ernest Lathem, M.D.
President, State Board
of Medical Examiners
527 Mills Avenue
Greenville, S. C. 29605

LETTER TO THE EDITOR

To the Editor:

Since publication of my paper, "Venereal Diseases of the Anorectum" in the October, 1985 issue, I feel that several observations should be restated, as follows:

1. The intranuclear inclusion bodies of herpes genitalis, apparent on staining of biopsied lesions are Cowdry type A intranuclear inclusions rather than Donovan bodies. (p. 526)
2. The agent of Lymphogranuloma Venereum is a Chlamydia organism, which in the opinion of many investigators is considered to resemble the bacteria more than the viruses. (p. 528)
3. My listing of rare veneral diseases of the anorectum included herpes simplex (p. 529): I intended to refer to herpes simplex virus type I here, rather than herpes simplex virus type II, which is the causative agent in herpes genitalis. (p. 526)

I apologize for any confusion that these oversights might have created.

Gabor F. Sovenyhazy, M.D.
1776 Skylyn Dr., P. O. Box 2768
Spartanburg, S. C. 29304

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Vol. 6, Issue No. 1 January 1986

ARE YOU A CANDIDATE FOR PROFESSIONAL MANAGEMENT?

Admit it. You're intrigued by the stock market but don't know where to begin. Or maybe you do but don't have the time to determine which stocks might prove poised for growth and when might be the best time to buy them.

Take heart; there is another alternative. You can hire a professional portfolio manager or pool your assets with others and purchase shares of a mutual fund. Both approaches are favored by successful, busy people who, for any number of reasons, prefer not to manage their own finances. And both actually take the responsibility for day-to-day trading activities out of your hands and place it in those of an experienced professional. Which might prove most suitable for you?

GETTING PERSONAL.....

If you're seeking an investment to meet your specific financial objectives, not to mention investment growth free of management concerns, you might want to look into professional portfolio management.

Professional portfolio management is a personalized service. It offers you the benefits of a portfolio receiving the full-time attention of market experts, research unavailable to the general public, and greater diversity than you could probably achieve on your own -- all for one annual fee.

Most professional management organizations require a minimum investment of at least $50,000 to $100,000 and the willingness to defer all decision-making abilities. But, because different managers employ different investment approaches, you can retain control of your financial destiny by selecting the one most appropriate for you.

What approaches are available? Conservative, aggressive and everywhere inbetween. You simply decide on the level of risk acceptable to you, then leave all other decisions in more qualified hands. Risk-averse managers concentrate on preservation of capital, while their more aggressive counterparts undergo greater risks in search of greater rewards. Growth-oriented managers seek to combine long-term appreciation and safety. As long as you can define your investment objectives and level of risk you are willing to assume, you should be able to find a professional investment management organization whose past performance matches your own expectations.

At Hutton, you are kept informed of portfolio purchases by copies of confirmations and a quarterly performance report. In addition, the Hutton Account Executive meets regularly with his or her professional management program clients in order to discuss the progress made toward meeting the clients' objectives.

THE MUTUAL FUND ALTERNATIVE.....

Perhaps you've been sold on the convenience of professional management but don't

have $100,000 to invest. Equity mutual funds offer investors the opportunity to participate in a professionally managed, diversified portfolio of common stocks. What's more, they enable you to participate at a level of risk at which you feel comfortable and with a minimum investment that can be as small as $500.

If you're seeking long-term growth but are reluctant to undergo excessive risk, an income, growth or a growth and income fund might be most suitable for you. However, if the pursuit of potentially high rewards makes you willing to assume above-average risk, you might consider an aggressive growth fund or a specialty fund investing in a specific area of the economy.

Keep in mind that mutual funds demand a long-term commitment. And they have generally provided returns that have outpaced both inflation and major market indices over an extended period of time (i.e., three to five years).

CHOICE AND FLEXIBILITY.....

There are other alternatives as well. For the more conservative investor who wishes to take advantage of an anticipated gain in the equity market, convertible bond funds provide an excellent means. The investor not only benefits from a current, competitive rate of return, but is positioned to participate in a stock market rise (as the underlying common stocks represented by convertibles move upward, the shares will appreciate).

And your options don't end here. Most mutual fund groups - such as the Hutton Investment Series family of funds - allow investors to exchange shares of one fund for those of another as often as they desire, and for a minimal charge. This feature may prove especially attractive as your personal financial objectives, or the market, change.

WHEN THE GOING GETS TOUGH.....

Investing in the stock market has never been easy. There are tens of thousands of securities available nationwide. And in today's volatile economy, the decisions are harder to make than ever. If you have too little time on your hands to select a portfolio and then watch over the details - or too much on your mind - you may be a candidate for professional management. Professional management is a broad field. And one that's constantly expanding. But whether it takes the form of a personalized approach or pooling your assets in a mutual fund, professional management can help make arriving at your financial destination, entirely manageable.

For your benefit, I will conduct an analysis of your current retirement program for the past three years in relation to: (1) investment objectives; (2) risk parameters; and, (3) recognized investment indexes. Of course, this analysis is at no cost to you. If you are interested, please contact me at the phone number and/or address below.

FURTHER INFORMATION

If you would like to receive further information on any of the topics covered in this newsletter, please write to Martin Lefkowitz, CFP, E.F. Hutton & Company, Inc. 2700 Middleburg Drive, Suite 200, Columbia, SC 29204; or Call (800) 922-1112.

* * * * * * * * * * *

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ON THE COVER:
A COMPENDIUM OF OPERATIVE SURGERY

In today's modern medical era of 10-0, 11-0, and even 13-0 nylon, skin staples and other high tech methods of closing surgical incisions, the cover photograph allows us to reflect on an earlier time when suturing and suturing material were far less complicated. The illustration on the cover is taken from *A Compendium of Operative Surgery* published in 1834 and written and illustrated by two Charleston physicians, Thomas L. Ogier, M.D., and Thomas M. Logan, M.D. This is a rare publication and one of the earliest treatises on operative surgery. It is a publication not included in the recently published *American Medical Imprint, 1830 through 1910.*

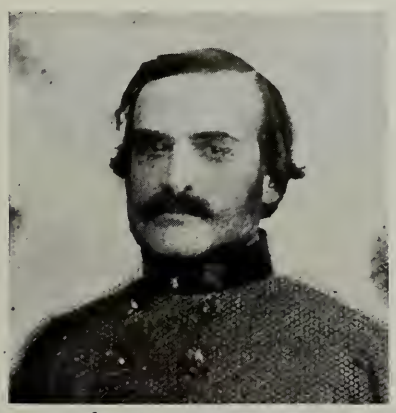
The various sutures and techniques are illustrated by numbers and letters and these are interpreted as "Figure No. 1, interrupted suture left untied; (a) a curved needle by which the thread is passed. Figure No. 2, continued suture; (b) where the thread is first passed and tied to the next stitch; (c) another kind of curved needle with which the suture was performed. Figure No. 3, twisted suture; (d) silver pins with, (e) a moveable steel point. Figure No. 4, quilled suture; (f) ordinary quills, (g) loops through which the first quill is passed; (h) bow-knots by which the lips of the wound are kept together and the thread secured over the second quill. Figure No. 5, looped suture (i) the point where all the threads are twisted into one mass; (k) an adhesive strip securing the twisted threads together at one side of the wound."

The Charleston physicians who contributed to this book contributed to the medical history of South Carolina in other ways.

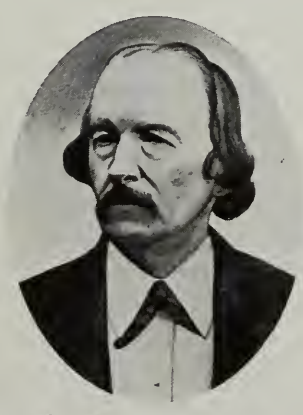
Thomas Muldrup Logan, M.D., 1808 to 1876, was born of a long line of Charleston physicians. His grandfather, George Logan and his father, George Logan, Jr., practiced medicine in Charleston through 1861. Thomas M. Logan, M.D., was educated at the College of Charleston and the Medical College of South Carolina. He studied extensively on two occasions in London and Paris and contributed extensively to agricultural and meteorological publications. An important writing of his concerned the climate and health in Charleston and was published in the *Southern Literary Journal* in 1836. Dr. Logan moved to San Francisco and then Sacramento, California, in 1850 and became a very distinguished physician of that state. He was president of the Medical Society of the State of California, and later, in 1872, became the president of the American Medical Association.

His co-author was Thomas Lewis Ogier, M.D., 1810 to 1900. Dr. Ogier was a member of a prominent Charleston family who provided for their son's primary education in England. He returned to Charleston and graduated from the Medical College of South Carolina in 1830. His early interest in surgery led to the creation of the present text which at the time contained descriptions of *all* surgical procedures. Dr. Ogier contributed personally to South Carolina and the south through his service as District Surgeon in the Confederate Army and later Medical Director for the states of South Carolina, Georgia and Florida. It was said of Dr. Ogier that "he was a man with the greatest personal magnetism, who shed sunshine and brightness in his path wherever he went."

— Thomas M. Leland, M.D., Ph.D.



Thomas L. Ogier, M.D.



Thomas M. Logan, M.D.

IN MEMORIAM

Dr. John Perry Miles, Jr., a Greenville Neurosurgeon, died on June 11, 1985. He received his M.D. degree from George Washington University and completed his internship and residency at the University of Louisville. Dr. Miles was an active member of the SMCA.

Dr. Lonita Boggs, a retired Pediatrician from Greenville, died on June 28, 1985. She was a graduate of South Carolina Medical College, and completed her residency at the University of Chicago. Dr. Boggs was an Honorary Member of the SCMA.

Dr. Peter J. Botzis, a General Practice physician from Columbia, died on June 4, 1985.

Dr. Sedgwick Simmons, a retired Family Practice physician from Charleston, died in July. Dr. Simmons was an Honorary Member of the SCMA.

Dr. Roderick Macdonald, an Ophthalmologist from Rock Hill, died on July 27, 1985. He was a graduate of the University of South Carolina and the Medical College of South Carolina. Dr. Macdonald was an active member of the SCMA and had previously served as its President.

Dr. Gerald Elledge McDaniel, a retired physician from Columbia, died on July 22, 1985. He attended Johns Hopkins University. Dr. McDaniel was an Honorary Member of the SCMA.

Dr. J. F. Daniel, a Gynecologist and Obstetrician from Greenwood, died on June 29, 1985. Dr. Daniel was a graduate of Furman and LSU School of Medicine.

Dr. William R. Craig, Jr., a retired physician from Greenville, died on July 29, 1985. He was a graduate of Emory University and Emory University School of Medicine. Dr. Craig was an Honorary Member of the SCMA.

Dr. J. B. Massey, a retired physician from Charleston, died on August 6, 1985.

Dr. Robert Wilson, a Physician/Professor from Charleston, died on August 20, 1985. He was a graduate of Princeton University and the Medical College of South Carolina. Dr. Wilson was a past President of the SCMA.

Dr. Walter D. Hastings, a retired General Surgeon from Greenville, died on August 26, 1985. He was a graduate of Duke University and Duke University School of Medicine. Dr. Hastings was an Honorary Member of the SCMA.

Dr. James B. Watson, a General Practice physician from Columbia, died on August 13, 1985. He was a graduate of College of Charleston and the Medical College of Charleston.

Dr. Edward E. McClaren, a retired physician from Greenville, died on August 19, 1985. He was a graduate of Shaw University and Howard University School of Medicine. Dr. McClaren was an Honorary Member of the SCMA.

Dr. Lawrence H. Erdman, a Columbia Surgeon, died on August 28, 1985. He was a graduate of Princeton University and Columbia College of Physicians and Surgeons in New York. Dr. Erdman was an active member of the SCMA.

Dr. Leonard W. Douglas, a Family Practice physician from Belton, died on September 18, 1985. Dr. Douglas was a graduate of Davidson College and the Medical University of South Carolina. At the time of his death, Dr. Douglas was president of the SCMA.

Dr. P. G. Jenkins, a retired Opthalmologist from Charleston, died on September 25, 1985. Dr. Jenkins was an Honorary Member of the SCMA.

Dr. Charles H. White, Sr., a retired physician from Sumter, died on October 7, 1985. He was a graduate of Wofford College and the Medical University of South Carolina. Dr. White was an Honorary Member of the SCMA.

Dr. Von A. Long, a retired physician from Newberry, died on November 17, 1985. He was a graduate of Clemson and the Medical College of Charleston.

Dr. William Leslie Yetter, a physician from Hilton Head Island, died on November 7, 1985. Dr. Yetter was a graduate of the University of Iowa Medical School. He was a member of the SCMA.

Dr. William Keefer Brumbach, a Surgeon from Gaffney, died on October 17, 1985. He was a graduate of Duke Medical University. Dr. Brumbach was an active member of the SCMA.

Dr. Imants A. Ceips, a general practice physician from Ridge Springs, died in October.

Those wishing to make Memorials in honor of their deceased colleagues may do so by sending contributions to the S. C. Institute for Medical Education and Research, P. O. Box 11188, Columbia, S. C. 29211.

SOUTH CAROLINA MEDICAL ASSOCIATION

AUXILIARY

LEGISLATIVE WORKSHOP

The South Carolina Medical Association Auxiliary is committed to efforts of the medical community to secure meaningful legislation to reform the tort code of South Carolina. Realizing that we are an untapped resource for lobbying efforts, the SCMAA held a legislative workshop for County Presidents and Legislative Chairmen on November 12, 1985.

The workshop was attended by more than fifty Auxilians from all areas of the state. Dr. John Simmons explained the "alphabet soup" dilemma of HMO's and PPO's. Dr. Simmons' talk was most informative and will be of great benefit to Auxiliary members who will be discussing alternative insurance options for their spouses' practices.

Bill Mahon and Susie Nickles conducted the session on tort reform. The bill was explained section by section and members of the General Assembly were reviewed regarding their position on the legislation. Suggestions were given on what could be done by Auxiliary members to help gain passage of the bill.

Senator John Courson was the keynote speaker for the luncheon at the Lace House. Senator Courson was most impressive. He stressed the importance of registering to vote and being committed to disseminating accurate, timely information to legislators so that informed decisions can be made on issues that affect the delivery of health care.

The Auxiliary can have a tremendous impact on the lobbying efforts of the SCMA. Your commitment is an essential ingredient in a healthy governmental program.

Carolyn Coker,
State Legislative Chairman
SCMA Auxiliary

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President's Page



THINGS TO THINK ABOUT

Dear John:

The winter doldrums have really set in, but the fur continues to fly thick and fast. Medicine continues to confront issues of tremendous magnitude, but I sense the commitment of the physicians across our state to preserve the quality of medical care for our patients in spite of efforts by others to commercialize our profession.

I attended the winter meeting of the AMA in Washington, D.C., and heard some things I thought you ought to know about. The organization is financially sound and very active. They have trouble with one subsidiary, which is the reinsurance program for physician liability companies. It appears that this drain on all liability pools is creating great difficulty in the reinsurance field and the AMA is struggling to maintain their reinsurance company as a viable entity. This same situation has worsened in South Carolina, as St. Paul Insurance Company has called a moratorium on sale of liability insurance to physicians in South Carolina for an indefinite period. It certainly reinforces what we have been trying to tell the people in the legislature.

The revolution in reimbursement to physicians was a hot topic at the AMA. It seems that this administration in Washington has about abandoned applying DRGs to physician services, but is looking at a final goal of capitation policies for all Medicare patients.

It will take some time to develop that program so in the interim they are looking at a stopgap type of relative value scale or simply freezing the present Medicare program for another year or maybe two. I hope our patients don't suffer in the interim.

Interestingly enough, additional states have voted to unify with the AMA and it appears that this is a national trend to closer knit all physicians in the country under one very strong umbrella. If you remember, I discussed this briefly with the SCMA House of Delegates last year and I hope we can address this issue when we meet in '86.

They tell me it was true, but I can't prove it. One of our classmates, named Al, had very black hair and as a freshman grew a very heavy black beard. He met Dr. Beech, then Chairman of Pediatrics, in the hall one day and Dr. Beech asked who he was. He replied that he was a freshman medical student. Dr. Beech then stated — "Well, if you don't shave that beard off by tomorrow morning, you'll be the first freshman medical student who ever failed sophomore pediatrics." Maybe we can look Al up one day and ask him if it really did happen.



Yours truly,
J. Gavin Appleby, M.D.
President

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We request that manuscripts be concise (no longer than 8 typewritten pages, double-spaced), with no more than ten references. These should be cited in the text in superscript, e.g., "Bottsford, et al.[3]", and should conform to the following style: "3. Bottsford JE, Bearden RC, Bottsford JG: A ten year community hospital experience with abdominal aorta aneurysms. *J S C Med Assoc* 79: 57-62, 1983." Ordinarily, publication of four small illustrations or tables or the equivalent will be paid for by *The Journal*. Manuscripts should be submitted in duplicate. Reprints will be made available by the publisher.

THE JOURNAL
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VOLUME 82 FEBRUARY 1986 NUMBER 2

INTRAVENOUS STREPTOKINASE IN ACUTE MYOCARDIAL INFARCTION: EXPERIENCE FROM A COMMUNITY HOSPITAL*

HAROLD G. MORSE, M.D.**
JOHN D. WARE, M.D.
JOSEPH M. KOVAZ, M.D.
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WILLIAM J. EPPERSON, M.D.
FREDERICK G. JONES, M.D.

The role of acute thrombosis in the pathogenesis of acute myocardial infarction has gained increasing support and acceptance.[1, 2] Use of fibrinolytic agents to recanalize acutely thrombosed coronary arteries in patients with evolving myocardial infarction has recently achieved considerable popularity. Most reported series have used acute angiography in treating these patients either for delivery of intracoronary streptokinase or to assess efficacy of intravenous treatment. Since early reperfusion appears critical to myocardial salvage,[3, 4] the vast majority of patients in the United States do not have access to angiography early enough to begin effective thrombolytic therapy.

Anderson Memorial Hospital is a 530 bed community hospital serving a population base of 225,000. Facilities for acute angiography are not available in our community and we treat over 300 patients with acute myocardial infarction each year. To offer our patients the potential benefits of thrombolytic therapy without acute angiography, a protocol for using intravenous streptokinase was developed by the Department of Medicine in the fall of 1983. This protocol was developed with the assistance of Dr. James F. Spann then at Temple University and now Chief of the Cardiology Division at the Medical University of South Carolina. Following is a report of our first eighteen months experience.

METHODS

A standardized protocol for intravenous streptokinase in acute myocardial infarction was developed and approved by the Department of Internal Medicine and the Pharmacy and Therapeutics Committee. This protocol was pre-printed and made available on standard physicians' order sheets (Figure 1). The orders could be initiated only by the attending physician in the Coronary Care Unit. Other therapeutic modalities such as

* From the Department of Internal Medicine, Anderson Memorial Hospital, Anderson, South Carolina.
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ANDERSON MEMORIAL HOSPITAL — PHYSICIANS' ORDERS

DATE	USE BALL POINT PEN ONLY	SPECIFY ROUTE OF ADMINISTRATION ON MEDICATION ORDERS
	INTRAVENOUS STREPTOKINASE PROTOCOL	
	FOR ACUTE MYOCARDIAL INFARCTION	
	Systemic streptokinase for use in patients suspected of having acute	
	coronary thrombosis within 4 to 6 hrs. of beginning therapy. Relative	
	contraindications include: Age over 70, external cardiac massage, surgery	
	within one month, head trauma, hypertension greater than 200/100,	
	recent bleeding, active peptic ulcer, previous treatment with streptokinase	
	in past 5 days to 6 months, C.V.A., intracranial surgery with in 6 months,	
	pregnancy, and diabetic hemorrhagic retinopathy.	
	Patient must be in Coronary Care Unit.	
		①

DATE	USE BALL POINT PEN ONLY	SPECIFY ROUTE OF ADMINISTRATION ON MEDICATION ORDERS
	PRE-TREATMENT:	
	Hydrocortisone 100 mg IV push over 2 min.	
	Benadryl 50 mg IV push over 2 min.	
	Lidocaine 100 mg - IV push over 2 min.	
	Lidocaine Drip at 2 mg/min.	
	Lidocaine 50 mg IV push 20 min. after first bolus.	
	Yes No Nitroglycerin protccol	
	EKG	
	Lab: CBC, P.T., P.T.T., Fibrinogen, cardiac profile, collect blood and hold	
	for possible crossmatch Do not type & screen.	
	After lab: Heparin 5,000 units IV push	
	Heparin drip 40,000 U in 1000 D5W. Run at 1000 U/hr (25 cc/hr).	②

DATE	USE BALL POINT PEN ONLY	SPECIFY ROUTE OF ADMINISTRATION ON MEDICATION ORDERS
	TREATMENT:	
	Streptokinase 1.5 million units. Dilute in D5W to 100cc's.	
	Infuse IV via pump over 1 hour.	
	Pre and Post flush with D5W then KVO.	
	POST-TREATMENT:	
	Continue Lidocaine, Heparin and Nitroglycerin (if applicable)	
	drips until further orders.	
	Two (2) hours post infusion: EKG, CBC, P.T., P.T.T.,	
	Fibrinogen then P.T.T. and H & H q 4hrs. X 3.	
	PO-81	③

FORM 100 (9/81) PHYSICIAN'S ORDERS

FIGURE 1

TABLE 1

	Age	Sex	Time To RX	Type MI/CPK	Clinical Reperfusion	Survival	Cath Reperfusion	Rx
1)	43	M	3.5	ANT/N	+	+	+	Medical
2)	55	F	1.3	INF/1118	+	+	+	PTCA
3)	45	F	3.3	INF/1780	+	+	-	Medical
4)	53	M	.7	ANT/1235	+	+	+	CABG
5)	69	M	7.0	ANT/478	+	+	+	PTCA
6)	64	M	2.3	ANT/1556	+	-	*	
7)	63	F	2.0	ANT/1260	-	-	*	
8)	49	M	1.3	ANT/1049	+	+	+	Medical
9)	54	M	4.0	INF/1698	+	+	+	PTCA
10)	56	M	1.5	INF/975	-	+	-	Medical
11)	73	M	2.7	ANT/1966	+	+	+	Medical
12)	74	F	5.7	ANT/540	+	+	+	CABG
13)	62	M	3.0	ANT/1035	+	+	*	Medical
14)	56	M	2.8	ANT/N	-	-	*	
15)	53	M	5.0	INF/523	+	+	+	PTCA
16)	56	F	4.0	ANT/	-	-	*	
17)	54	M	1.5	INF/1092	+	+	+	PTCA
18)	69	F	3.0	ANT/2280	-	-	*	
19)	63	M	3.5	INF/894	+	+	+	Medical
20)	55	F	1.3	ANT/896	+	+	+	Medical
21)	53	M	2.0	ANT/179	+	+	+	Medical
22)	67	M	1.2	INF/448	+	+	+	PTCA
23)	56	M	1.5	ANT/2325	+	+	+	PTCA
24)	55	F	3.0	ANT/2529	-	-	*	
25)	59	M	5.0	ANT/5625	-	+	-	Medical
26)	45	M	2.7	ANT/308	+	+	+	PTCA
27)	66	F	2.3	INF/378	+	+	*	Medical
28)	50	M	3.5	ANT/3141	+	+	+	PTCA
29)	63	M	7.0	Diffuse/1704	-	-	*	
30)	49	M	4.25	Lateral/933	+	+	+	Medical
31)	57	M	4.6	Ant-Lat/233	+	+	+	CABG
32)	54	M	4.0	ANT/1649	-	+	-	Medical
33)	44	M	1.25	INF/242	+	+	+	Medical
34)	65	M	2.0	ANT/110	+	+	+	Medical
35)	64	M	2.5	INF/3127	-	+	-	Medical

* Cath not performed.

nitrates, calcium channel blockers, or beta blockers were used at the discretion of the attending physician. Emergency room and coronary care nursing personnel received inservice training in the use of streptokinase and were asked to assist in screening for contraindications. The importance of prompt initiation of therapy was stressed. Reperfusion was judged clinically by relief of pain, abrupt onset of ventricular ectopy consistent with reperfusion arrhythmia or improvement in EKG abnormalities.

RESULTS

Between January 1983 and July 1985, a total of 35 patients meeting defined eligibility criteria were treated with the protocol (Table 1). Average age was 55.5 years with 26 males and nine females. Infarct location by EKG was 24 anterior and 11 inferior. Average time from onset of pain to treatment was three hours (ranging from 45 minutes to seven hours). Clinical reperfusion was suspected in 71 percent of patients.

Therapy was well tolerated with only one major bleeding complication. Case #25 experienced an UGI hemorrhage 36 hours after treatment which required a four unit blood transfusion and resolved with cessation of Heparin therapy.

Mortality rate for the series was 20 percent. All deaths occurred in patients with large anterior infarctions none of whom had clinical signs of reperfusion. Six had cardiogenic shock at presentation and one died of a myocardial rupture at 20 hours. None of the mortalities experienced bleeding complications. Of the 28 survivors, 26 received coronary artery angiography two to 10 days after treatment. The infarcted vessel was patent at cath in 22 of these. Of the 22 patients suspected clinically to have reperfused who underwent angiography, 21 had a patent vessel at cath. Coronary angioplasty was performed in nine patients, and three underwent bypass surgery.

DISCUSSION

There is increasing evidence that early restoration of blood flow to an acutely ischemic segment of myocardial tissue can decrease cell injury and death and salvage myocardial function.[4] Intracoronary administration of streptokinase can effectively restore coronary blood flow in roughly 75 percent of patients treated within three to six hours from the onset of pain.[5] At least one randomized trial has shown reduced one year mortality in patients successfully reperfused with intracoronary streptokinase.[6] Unfortunately, emergency coronary angiography and intracoronary streptokinase infusion require sophisticated equipment and a specially trained operator. The infarct must occur in proximity to a major medical center and the patient must present shortly after onset of pain. If therapy is delayed beyond six hours of infarction, it is unlikely to be beneficial.[3] Such therapy would, therefore, be of no benefit to the majority of South Carolinians suffering from myocardial infarction.

Intravenous streptokinase has an obvious appeal, being simple to administer, less expensive, and available for more widespread application. It can also be administered quite early in the course of the illness, in a community hospital, avoiding the delay of transport and time to perform cardiac catheterization. Frequency of reperfusion is slightly lower with intravenous than with intracoronary therapy (average 51 percent vs. 75 percent).[5] However, the speed of administration may prove intravenous therapy to be equally effective overall. Bleeding complications requiring either transfusion or surgical repair have been extremely low (average .8 percent[5]), and to date, no bleeding deaths or major intracranial hemorrhage have been reported.

We believe that our 18-month experience in Anderson shows that intravenous streptokinase can be given safely and effectively in carefully selected patients with acute myocardial infarction

in a community hospital without acute angiography.

Our very low complication rate is similar to that of other reported series. All deaths in our series occurred in patients who did not reperfuse clinically and suffered massive anterior infarction. We feel that all patients in whom reperfusion is suspected clinically should be referred for coronary angiography and that this should be done as soon as the patient is stable for transport. Heparin therapy should be continued if possible until angiography is performed.

The importance of early restoration of blood flow cannot be over-emphasized. Most authors agree that treatment beyond six hours after the onset of pain is less likely to be effective and of doubtful benefit. Paramedics and Emergency Room personnel need to be aware of the importance of prompt evaluation and treatment. The public also needs to be aware that some new treatments for myocardial infarction require intervention within the first few hours of pain. In Anderson County, coronary patients presenting in the first few hours of pain continue to be in the minority. More public education in this area is needed.

SUMMARY

To determine whether intravenous streptokinase could be delivered safely and effectively in a community hospital without acute angiography, the following protocol was utilized. Thirty-five patients meeting defined eligibility criteria were treated with intravenous infusion of 1.5 million units of streptokinase shortly after arrival in the emergency room. Average time from onset of pain to treatment was three hours. Therapy was well tolerated without significant complication. Clinical reperfusion was suspected in 71 percent of patients. Coronary angiography was performed at referral hospitals in 93 percent of surviving patients two to ten days after treatment. The infarcted vessel was patent in 95 percent of patients in whom reperfusion had been present clinically. Angioplasty was performed in nine patients and three underwent bypass surgery. We conclude that intravenous streptokinase can be safely and effectively used in community hospitals without acute angiography in carefully selected patients with acute myocardial infarction. □

ACKNOWLEDGEMENTS

The authors wish to thank the nursing staff of the Emergency Room and Coronary Care Unit of Anderson Memorial Hospital for their patience and assistance in development of this protocol. Particularly, Sheryl Hunter, R.N., and Camille Scowcroft, R.N., provided much needed support. The residents in our Family Practice Residency Program were particularly helpful in caring for the patients and reviewing the data.

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USE OF COMBINED CALCIUM CHANNEL BLOCKERS FOR THERAPY OF REFRACTORY ANGINA PECTORIS*

WALTER ENNIS JAMES, III, M.D.**
ROBERT B. LEMAN, M.D.
MICHAEL E. ASSEY, M.D.

The conventional medical therapy of angina pectoris has allowed us to obtain symptom control in a majority of patients. Those patients who have angina of unacceptable frequency, despite medical therapy, can be evaluated and referred for surgery or angioplasty. Not infrequently, patients will be identified who are refractory to conventional medical therapy and who are not good candidates for coronary artery bypass surgery or angioplasty. These patients present a dilemma in deciding whether their angina should be allowed to continue on maximal therapy or whether they should be submitted to surgery or angioplasty while anticipating less than ideal outcomes.

In an attempt to offer additional relief in our patients with refractory angina pectoris who were not candidates for revascularization, we utilized combined calcium channel blocker therapy. In addition to the usual combination of nitrates, beta blockers, and a single calcium channel blocker in these patients, we added a second calcium channel blocker in an attempt to gain symptom control.

METHODS

Between June 1983 and January 1985, ten patients from the Medical University of South Carolina and the Charleston V.A. Hospital were identified who had refractory angina pectoris and who were not candidates for coronary bypass grafting or coronary angioplasty. There were nine males and one female with an age range of 44 to 63 years and a mean of 54 years. Nine out of 10 patients underwent cardiac catheterization and coronary arteriography to assess their persistent angina. Catheterization was done by the Seldinger technique and included ventriculography, coronary arteriography, and hemodynamic measurements. Cardiac catheterization revealed left main coronary artery disease in one patient, triple vessel disease in five, double vessel disease in one, and single vessel disease in two patients. One patient did not undergo catheterization because of severely depressed left ventricular function with an ejection fraction of 15 percent determined by radionuclide ventriculography.

Ejection fraction in the study group was determined from contrast ventriculography or radionuclide ventriculography. Ejection fractions ranged from 15 to 81 percent with a mean EF of 51 percent. Six of the ten patients had an EF of over 50 percent. EKG's were reviewed in all patients. Conduction system disease was present in four patients: two had 1° AV block, one had LBBB, and one had transvenous ventricular pacemaker due to chronic complete heart block. Three patients showed evidence of old myocardial infarction. The remaining three patients' EKG's showed nonspecific changes or were normal. During the study, there was no change in any patient's rhythm nor progression of conduction system disease.

Five patients had New York Heart Association Class III angina and five of them had New York Heart Association Class IV angina. Five patients had previously undergone coronary artery bypass surgery and were felt not to be candidates for reoperation. Of the remaining five patients, two patients refused angioplasty or coronary artery bypass surgery. The other three patients had difficult coronary artery anatomy and because of technical considerations, coronary artery bypass

* From the Department of Medicine, Medical University of South Carolina, 171 Ashley Avenue, Charleston, S. C. 29425. This work, presented at the regional meeting of the American College of Physicians, Kiawah, S. C., on March 17, 1985, was done while Dr. James was a fellow in the Division of Cardiology.
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surgery or angioplasty was deferred. All patients at the beginning of the study were on single calcium channel blocker in addition to maximum conventional anginal therapy with nitrates and/or beta blockers. The majority of the patients had been tried on several calcium blockers utilized sequentially, without successful control of symptoms of development of intolerable side effects. Because of the inability to control symptoms with multiple medical therapy, a second calcium channel blocker was added to the first. These patients then fell into four groups of therapy: Group I consisted of three patients who obtained the best balance between efficacy and side effects on nifedipine (120 to 160 mgs per day) and diltiazem (180 mg daily or less). Group II consisted of three patients on moderate doses of nifedipine (<120 mg/day) used in combinations with moderate doses of diltiazem (<180 mg/day). Group III consisted of three patients who responded maximally to high doses of diltiazem (greater than 180 mgms per day) in combination with low to moderate doses of nifedipine. Group IV consisted of a single patient whose best clinical response was on a high dose of verapamil 640 mgs per day in combination with diltiazem 90 mgs per day. This patient could not tolerate nifedipine because of headache. He had good control with verapamil earlier in his course but because of recurrent symptoms, a second calcium channel blocker had to be used. These patients were followed to evaluate the efficacy and side effects of these drug combinations. Adjustments in the maximum tolerated dosage of the best calcium channel blocker combination and other antianginal therapy were precisely made in an attempt to maximize symptom control and minimize side effects. The patients were followed from eight to 16 months with a mean follow-up of 12.8 months. Follow-up was completed in all 10 patients.

RESULTS

At the initiation of the study, all patients were on medical therapy which usually consisted of a long-acting nitrate, a beta blocker, and a calcium channel blocker. Three patients were not on beta-blocking agents due to a history of CHF. One patient was not on long acting nitrates due to severe headaches.

With the addition of a second calcium channel blocker to their medical therapy, seven of 10 patients improved in the severity of their angina. Six improved by one class of New York Heart Association and one improved by two classes. At the conclusion of the study, no patient who responded remained with Class IV angina. Three patients developed intolerable side effects which necessitated stopping one of the calcium channel blocking agents. One patient in Group III developed severe headaches, another patient in Group III had initial improvement in angina but developed persistent fatigue which required stopping the second calcium channel blocker. One patient in Group I also had pronounced fatigue without angina improvement which necessitated his withdrawal from the second calcium blocker.

All three patients in Group II (moderate doses of diltiazem and nifedipine) had improvement in their anginal symptoms and no patient in this group had intolerable side effects. Two patients in Group I (high dose nifedipine and moderate to low dose diltiazem) had improved angina symptoms. The third patient in this group had no improvement in chest pain and developed intolerable fatigue. All three patients in Group III (high dose diltiazem and moderate dose nifedipine) improved but one developed severe headaches and another had orthostatic light headedness and fatigue which required these patients to stop the second calcium channel blocker.

Of the original seven responders, three patients developed recurrent unstable angina. This occurred at six, nine and 12 months after initiation of the second calcium channel blocker. Four patients continued to have long-term improvement in their angina symptoms at the conclusion of the study which was a mean follow-up of 12.8 months. The single patient in Group IV (verapamil and diltiazem) developed mild clinical congestive heart failure after one year of the combined therapy. His angina remained well-controlled and his failure responded to digitalis and diuretic therapy. Both verapamil and diltiazem were continued at the same dosage level without further congestive symptom.

DISCUSSION

There are several characteristics of calcium channel blockers which suggest that each of the three currently available products acts through different mechanisms and that their beneficial effects may be synergistic: Their chemical structure suggests that their site and mechanism of action may be different. Nifedipine is a di-

hydropyridine derivative, diltiazem is a benzothiazepine derivative, and verapamil was derived from the papaverine group. There is evidence that these agents work at different sites within the cell;[1,2] nifedipine and verapamil affect the influx of calcium, nifedipine by chemically blocking the receptor site, while verapamil has a regulatory effect on the rate of calcium channel gate opening. Diltiazem acts to lower intracellular calcium through a mechanism which increased efflux or calcium from the cell.

Although side effects were common in our patients, it is important to remember that the majority of these patients was also on maximum dosages of beta blockers and nitrates. Many of the side effects encountered were probably related to the combined use of nitrates, beta blockers, and calcium channel blockers as opposed to the calcium channel blockers alone. Mild congestive heart failure developed in a patient who was on an unusual combination of calcium channel blockers, verapamil, and diltiazem, as well as beta blockers. This patient previously had a normal ejection fraction and normal wall motion on radionuclide ventriculography. The combination of verapamil and diltiazem might be expected to have a pronounced negative effect on inotrophy especially at the dosage used.[3] This combination was tolerated for approximately one year before mild failure developed, without evidence of an intervening ischemic event.

Other side effects which were not encountered but which might have been anticipated in the use of combined calcium channel blockers included possible development of bradyarrhythmias or heart block. These were not seen in any of our patients. We had one patient with left bundle branch block, two with first degree AV block in the study, and there was no change or worsening of conduction system disease in these three patients.

Difference in efficacy and side effects were noted between the four groups studied. Group II patients (moderate doses of both diltiazem and nifedipine) all showed improvement in anginal symptoms while none in this group developed intolerable side effects. The more frequent incidence of side effects in groups using maximal dose of one calcium channel blocker in combination with lower doses of a second blocker is not surprising. This fact suggests that reducing the dose of the first calcium channel blocker prior to adding the second agent may minimize side effects and still allow adequate control of symptoms. We can not exclude the possibility that Groups I and III contained patients with more refractory angina requiring larger drug dosages in an attempt to control symptoms. However, the mean ejection fraction of Group II was 52 percent, not significantly different from Groups I and III (49 percent). Three vessel or worse coronary disease was present in two-thirds of Group II which was similar to the combination of Groups I and III. Therefore, there was not a significant angiographic difference to explain the therapeutic advantage of Group II.

Our conclusions are that the combined use of calcium channel blockers may be efficacious in patients with refractory angina pectoris despite maximal medical therapy and who are not candidates for coronary artery bypass surgery or percutaneous transluminal angiolasty. We found the side effects to be fairly common, but frequently manageable. Side effects required the discontinuance of the second calcium channel blocker in 30 percent of our patients. Because of progression of coronary atherosclerosis, symptoms may return after initial therapeutic success. We do not suggest that the combined use of calcium channel blocking agents become conventional therapy for the usual patient with angina pectoris. Because of the considerable potential of these drugs to produce problems when used in combination, we would recommend that this type of patient be managed by a cardiologist.

SUMMARY

Conventional medical therapy, angioplasty, or coronary bypass surgery usually controls angina in the majority of patients. Patients with refractory angina after bypass surgery or maximal medical therapy present a rare but significant problem. We identified ten patients with refractory angina despite maximum medical therapy and/or bypass surgery. This therapy included nitrates, beta blockers, and the sequential use of single calcium blockers. Because of the inability to control symptoms, a second calcium channel blocker was added to the first and various combinations of calcium blockers were used. Of the ten patients initially started in this protocol, three patients had intolerable side effects. Seven patients responded well to combination therapy. However, three patients later became refractory to combination

therapy after a mean of nine months of treatment. The combined use of calcium channel blockers may be efficacious in a selective group of patients with refractory angina pectoris. Side effects were found to be fairly common but frequently manageable. Because of progression of coronary atherosclerosis, symptoms may return after a favorable initial therapeutic response. □

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SCMA NEWSLETTER

February, 1986

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138th SCMA ANNUAL MEETING
THE SHERATON CHARLESTON HOTEL
APRIL 23 - 27, 1986

For the sixth consecutive year, the SCMA's Annual Meeting will be held at the Sheraton Charleston Hotel. By the time this *Newsletter* reaches your office, you should have received registration materials and a copy of the program. Please send in your registration early, both to the Sheraton and to SCMA Headquarters!!

MEETING HIGHLIGHTS

SOCPAC SPEAKER: *Mr. Roy Pfautch*, nationally known political consultant and Past President of the American Association of Political Consultants, will be the guest speaker at the SOCPAC luncheon, scheduled for Saturday, April 26 at 12:45 p.m. Mr. Pfautch has also served as a research analyst for AMPAC and many other organizations.

AMA GUEST: *Harrison L. Rogers, Jr., M. D.*, President of the American Medical Association, will address the House of Delegates on Thursday morning, April 24.

SPECIAL AWARDS: Presentations of special awards include the *A. H. Robins' Physician's Award for Community Service; the Thomas A. and Shirley W. Roe Award for the best article by an institution-based physician published in* The Journal *during 1984 and 1985; and the SCMA President's Award.* In addition, this year two journalism awards will be presented, *one for the best health-related article in the print medium and for the best in the broadcast medium.* Applications are now being accepted.

SCIENTIFIC SESSIONS AND CONCURRENT MEETINGS: The SCMA CME Committee has arranged an outstanding scientific program for this year's Annual Meeting. Topics for the general scientific sessions on Friday and Saturday mornings are *"Current Concepts in Cardiology,"* moderated by J. O'Neal Humphries, M. D., and *"Infectious Diseases: Issues and Challenges,"* moderated by James C. Allen, M. D. A Risk Management Workshop and Sports Medicine Seminar are also scheduled, as well as afternoon scientific workshops on a variety of topics on Wednesday, Thursday and Friday. CME credit will be awarded on an hour-for-hour basis.

Concurrent meetings will be held by the *S. C. Radiological Society, the S. C. Society of Neurological Surgeons, the S. C. Society of Pathologists and the S. C. Pediatric Society and S. C. Chapter of the American Academy of Pediatrics.*

138TH ANNUAL MEETING (CONTINUED)

SOCIAL FUNCTIONS: The SCMA President's Banquet is planned for Saturday evening, April 26, and will be preceded by a reception. The SCMA reception honoring Delegates, Alternates and Exhibitors will be on Thursday evening and Geer Drug Company is sponsoring a cocktail reception on Friday evening.

Again this year, Mead Johnson Nutritional Division has organized and will provide the prizes for a golf tournament to be held on Friday. Alumni receptions are planned by Duke and MUSC.

DEADLINES: Officer, Trustee and Committee Chairmen's Reports must be submitted to the SCMA by March 3 for publication in *The Journal*, and by March 10 for inclusion in the Delegates' Handbooks. Component medical societies should also note the same deadlines for submitting Resolutions.

SCMA MEMBERSHIP TOTALS

Membership in SCMA continues to rise. Active members show a five percent increase over the comparable period last year. As of January 24, 1986, we have already received more contributions to SOCPAC/AMPAC and AMA-ERF than the entire 1985 membership year.

Below is a comparison of membership categories on the same date in 1985 and 1986, including the voluntary contributions:

January 24, 1986	January 24, 1985
1993 - Active Members	1894 - Active Members
3 - Affiliate Members	2 - Affiliate Members
21 - First Year Physicians	4 - First Year Physicians
53 - Intern/Residents	91 - Intern/Residents
63 - Students	0 - Students
516 - SOCPAC	269 - SOCPAC
546 - AMA/ERF	144 - AMA/ERF
220 - Honorary Members	196 - Honorary Members

We express our gratitude to those who have so promptly responded, and solicit your support in urging your non-member colleagues to become a part of the new unified SCMA team.

CAPSULES....

SCMA Honorary membership status has been awarded to *William C. Cantey, M. D., Hubert Clayton, II, M. D., Lewis M. Davis, M. D., Francis H. Gay, M. D., Hjalmar Gudmundson, M. D., Anne D. Morgan, M. D., Samuel G. Rankin, M. D., James A. Scott, M. D., Lawson W. Stoneburner, M. D., James M. Timmons, M. D., James F. Williamson, M. D., Gilbert F. Young, M. D., Frederick Brown, M. D., and G. Preston Cone, Sr., M. D.* Affiliate membership status has been awarded to *Walter E. Brooks, M. D., and Jerome Weinstein, M. D.*

....*Richard Richardson, M. D.*, has been appointed as the SCMA representative to the DHEC Family Planning Advisory Council, and *Tom Austin, M. D.*, will represent the SCMA on a Task Force being created by DSS to develop policies and procedures to implement the disabled infant (Baby Doe) provision of the child abuse amendment of 1984

CLAIMS FORMS REMINDER

Physicians are reminded that they can no longer obtain complimentary supplies of HCFA's Medicare claim forms from carriers. These forms must now be purchased from the AMA or commercial providers. Complimentary distribution of Standard Form HCFA-1500 ended October 1, 1985 when new HCFA regulations eliminated free distribution as part of its increased efforts to reduce federal cost outlays for Medicare.

You will want to make sure you have an ample supply of these claim forms which are available from the AMA as well as from commercial suppliers. The AMA, which has responsibility for monitoring changes required in the form, provides supplies that are reasonably priced and of high quality.

AMA prices are as follows:

Single sheets (OP 501), carton of 1,000	$34.10
Two-part snapout (OP 502), carton of 1,000	$49.50
Two-part computer pinfeed (OP-503)	$51.75

Prices include UPS and other charges. There is a discount for bulk orders. Also, there is a ten percent discount for AMA members. All inquiries should be directed to AMA *Insurance form Book and Pamphlet Fulfillment, American Medical Association, PO Box 10946, Chicago, IL 60610-9968; telephone (312) 280-7168.* There is quick turnaround time on orders and delivery can be anticipated in two weeks.

PATIENT INFORMATION AND EDUCATION MONTH

February, 1986 has been proclaimed by Governor Richard W. Riley as *Patient Information and Education Month.* In the Governor's proclamation, he states, "I urge the support of all health professions in the state in efforts to foster a wiser, more informed use of prescription drugs."

The South Carolina Medical Association will respond in cooperation with the Governor's Task Force on Prescription Drug Abuse by participating in a *"Get the Answers"* campaign, designed to make your patients aware that they should ask questions about their prescription drugs so they may understand and follow your directions regarding their medications.

Patient brochures for your waiting room are available at no cost from the SCMA office, as well as posters which you may wish to display. They urge your patients to "get the answers," by asking such questions as --

* What is the name of the drug and what is it supposed to do?
* How and when do I take it -- and for how long?
* What foods, drinks, other medicines or activities should I avoid while taking this drug?
* Are there any side effects and what do I do if they occur?
* Is there any written information available about the drug?

To obtain a supply of brochures and/or posters, contact the Office of Information, SCMA Headquarters, PO Box 11188, Columbia 29211, or call 252-6311.

CONTINUING DISABILITY REVIEW PROCESS

The Disability Determination Division of the South Carolina Department of Vocational Rehabilitation has asked that we furnish information to our member physicians regarding major changes in the Social Security and Supplemental Security Income Disability Programs.

The Continuing Disability Review Process was one of the major parts of the Social Security Disability Benefits Reform Act of 1984. The review of these cases resumed in January, 1986. The new law makes the review process substantially different, and the cornerstone of this process is the medical improvement standard. Now, in determining continuing eligibility, SSA will consider whether an individual's condition has improved since the initial award of benefits, and benefits will continue unless such improvement can be shown and the person can do substantial gainful work.

Continuing Disability Review Cases resumes will be divided into three categories to allow for an orderly review procedure, as follows:

Medical Improvement Expected: This category represents cases where medical improvement can be predicted at the time of the initial decision and are usually scheduled for review within 18 months after the initial decision. These cases will be processed in the traditional review manner using a face-to-face interview in the Social Security District Office and full Disability Determination developmental practices, including the new medical improvement standard.

Medical Improvement Possible: This category represents the beneficiaries subject to the 1980 Disability Amendments requirements for triennial periodic review. Processing of these cases will be completed using the same methodology as in the category above.

Medical Improvement Not Expected: This category represents disability conditions identified as "permanent impairments" by SSA. The law requires that these cases be reviewed, but less frequently than others. Because of the established condition, such as muscular dystrophy, statutory blindness, and amputation of a leg at the hip, the major issue in these cases is not medical improvement but whether the beneficiary has gone back to work or meets one of the exceptions to the medical improvement standard. SSA has expanded its definition of "permanently disabled" so that nearly four in 10 beneficiaries are exempted from the more frequent review.

Community physicians and hospitals remain the primary sources for documentation of impairment presence and severity. These new changes will have a direct impact because there will be a direct increase in medical records requests from disability case processors in order to document the status or progressive nature of impairments and to establish a longitudinal history of treatment. The continued cooperation of all members of the medical community will enable case processors to provide more accurate decisions regarding individual's entitlement to disability benefits.
For more information, contact R. A. Vandiver, Director, Disability Determination Division, State Office, PO Box 4945, Columbia 29240, or call Mr. Wayne Nance at 758-7752.

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The March, 1985 issue of The Journal of the South Carolina Medical Association will be an expanded issue on the cost effective use of antimicrobial therapy. Watch for your copy next month!

ETIOLOGY OF HOSPITALIZED PESTICIDE POISONINGS IN SOUTH CAROLINA, 1979-1982*

STANLEY H. SCHUMAN, M.D., Dr.P.H.**
SAMUEL T. CALDWELL, M.A.
NORRIS H. WHITLOCK, M.S.
JERE A. BRITTAIN, Ph.D.

The first statewide survey of hospital admitted pesticide poisonings in South Carolina reported an average of 39 cases per year during 1971-1973.[1] Non-occupational cases accounted for 42 percent of the total, occupational poisonings represented 37 percent, and 18 percent were intentional. No deaths were recorded in the 117 patient records. The survey reported herein was conducted in order to update these findings.

METHODS

The Statewide Hospital Discharge System (SHDS)*** identified those general hospitals which had cases of pesticide poisoning (58 out of 74 hospitals). Cases were identified through a computer search of primary and secondary diagnostic codes of discharge summaries for all hospitalizations during 1979-1982. ICDA diagnostic codes of interest included 989.2 (chlorinated pesticides), 989.3 (cholinesterase inhibiting pesticides) and 989.4 (other pesticides). After chart review, 20 patient records or six percent of the cases listed by the SHDS were found to have been miscoded by the hospitals; these hospitalizations were not due to pesticide exposure.

All hospitals except one cooperated with the study. Records were abstracted either by medical records staff or by one of the authors. In the interest of patient confidentiality, no follow-up interviews were conducted.

RESULTS AND DISCUSSION

There were 314 admissions for pesticide poisoning during 1979-1982. The cases varied considerably by year and exposure category as listed in Table 1. Nineteen cases (six percent) are reported as "exposure undetermined" because their medical records were not available for review. SHDS data indicated that none of the nineteen was fatal.

Non-occupational Exposures

Non-occupational poisonings accounted for 53 percent of all cases and accidental poisonings in children (37 percent) led all exposure categories. The home environment was the place of poisoning for 101 of the 116 poisonings in children while 15 were associated with farming. Forty-four cases in the home resulted from child access to pesticide containers, six of which were soft drink bottles. Thirty-four poisonings resulted from child access to treated areas of the home with most of the children ingesting rodent baits. Two children were hospitalized after exposure to home application equipment. The circumstances of 21 children (21 percent) poisoned in the home could not be determined because their medical records did not indicate the source of exposure.

Table 1

314 HOSPITALIZED PESTICIDE POISONINGS IN SOUTH CAROLINA BY EXPOSURE CATEGORY, 1979-1982

Exposure Category	*Hospitalizations* 1979	1980	1981	1982	*Total* n/%
Non-occupational:					
Child	25	34	41	16	116/37
Adult	13	13	16	8	50/16
Occupational:					
Ag. Related	26	16	19	15	76/24
Other[1]	0	0	2	1	3/01
Intentional	10	10	17	13	50/16
Undetermined[2]	4	9	4	2	19/06
Total	78	82	99	55	314/100

[1] Other: 1981 = 2 pesticide formulating employees, 1982 = 1 highway department applicator.

[2] Patient records not available for review.

° From the Agromedicine Program of Clemson University, Clemson, S. C., and the Department of Family Medicine, Agromedicine Program, Medical University of South Carolina, Charleston, S. C.

°° Address correspondence to Dr. Schuman at the Department of Family Medicine, Medical University of South Carolina, 171 Ashley Avenue, Charleston, S. C. 29425-2217.

*** Office of Research and Statistical Services of the South Carolina Budget and Control Board.

Of the 15 children exposed to agricultural pesticides, ten (66 percent) had access to the containers. A two-year-old female died in 1981 of cardiac arrest after ingesting a cholinesterase inhibiting insecticide (parathion). Two children were exposed while playing around application equipment. A one-year-old boy was severely poisoned by absorbing parathion from hugging his father who had not changed his contaminated clothing after spraying crops all day. The poisoning circumstances of two children were not determined, however their medical records described exposure to agricultural insecticides.

The home was the setting for 40 non-occupational poisonings in adults. Twenty-three cases involved exposure during application; 12 to gardens or yards and 11 to dwellings. Seventeen adults accidentally ingested pesticides and eight occurred when the patients were under the influence of alcohol. Five adults were hospitalized after their work places were treated with insecticides. Five firemen were poisoned while extinguishing fires which involved pesticides. Two deaths were observed in the adult/non-occupational exposure category. In 1980 a 60-year-old homeowner died as a result of aspirating stomach contents after he treated the crawl space of his home with chlordane. In 1981 a 41-year-old urbanite died from systemic poisoning after being overcome by an aerosol fogger in his home.

Occupational Exposures

Occupational exposures were documented in 25 percent of the cases. Seventy-six admissions (24 percent) were related to agriculture. Forty-nine agricultural workers were hospitalized following exposure during application. A 67-year-old farmer died in 1979 after spraying two organophosphate insecticides on two consecutive days. He was comatose and in respiratory distress upon admission and expired three days later. Since he had not bathed nor changed his clothing for 48 hours prior to admission, dermal absorption of organophosphates was likely.

Nine agricultural workers were poisoned as a result of mixing/loading operations, three from maintenance on application equipment and ten while "working in the fields." The source of exposure was not recorded for four workers. One 59-year-old worker accidentally ingested a large amount of malathion which had been placed in a beer bottle. Ten days later he died of renal failure and cardiac arrest secondary to organophosphate poisoning.

Three of the occupational poisonings were not related to agriculture. Two worked for pesticide companies formulating organophosphates and one worked for the highway department spraying a carbamate (Table 1).

Intentional Exposures

Intentional poisonings accounted for 16 percent of all hospitalized cases, 49 of whom were suicidal and one unsuccessful homicide. Only two of the intentional poisonings resulted in death. In 1980 a 71-year-old retiree who ingested a chlorinated insecticide (lindane) died on the seventh day of hospitalization. The second death occurred in 1981 when a 29-year-old male injected himself intravenously with an organophosphate (malathion). This patient survived 13 days before dying of cardiac arrest and respiratory failure.

Chemical Class

Table 2 lists the patient exposure categories by chemical class of the poisoning agents. Insecticides accounted for 71 percent of all poisonings and organophosphates were predominant (46 percent). Diazinon and malathion were the leading organophosphates in both non-occupational and intentional categories (62 cases). Parathion and ethoprop led the agricultural poisonings with a total of 15 cases.

Carbamates were named in 17 percent of the hospital records. The agricultural exposure category represented three-quarters of carbamate poisonings with methomyl and carbofuran accounting for 30 of the 39 cases.

Chlorinated hydrocarbon, synthetic pyrethroid and other insecticide chemical classes combined accounted for only eight percent of all cases. These chemicals are generally less toxic than organophosphates/carbamates.

Thirty-one cases (11 percent) of rodenticide poisoning were found in the child and intentional categories. Warfarin, an anticoagulant, accounted for 29 cases while two were due to Vacor.

Three patients were hospitalized due to herbicides, two having been exposed to paraquat on the farm.

Although the pesticide agent was not named in 50 hospital records, the exposure to a "bug or insect poison" was documented. Twenty-two children and 14 intentional poisonings account for most of such cases.

Table 2
EXPOSURE GROUPS BY CHEMICAL CLASS
AND OTHER CHARACTERISTICS, n = 295[1]

	Non-Occupational		*Occupational*			*Total*
	Child	*Adult*	*Agric.*	*Other*	*Intentional*	*n/%*
Number:	116	50	76	3	50	295/100
CHEMICAL CLASS						
Insecticides						
Organophosphates	51	28	27	2	28	136/46
Carbamates	8	3	39	1	1	52/17
Chlorinated Hydrocarbon	1	4	0	0	1	06/02
Synthetic Pyrethroid	5	4	2	0	1	12/04
Other	3	2	0	0	0	05/02
Rodenticides	26	0	0	0	5	31/11
Herbicides	0	1	2	0	0	03/01
Not Specified[2]	22	8	6	0	14	50/17
CHARACTERISTICS						
$\bar{X}$ Age (years)	2.6	44.8	31.7	31.3	30.5	—
% Male	62	72	96	100	56	—
% White	40	74	80	33	62	—
% Confirming Lab Tests[3]	12	14	18	0	26	—
$\bar{X}$ Days Hospitalized	2.6	4.2	2.2	3.3	5.5	—

[1] 314 cases identified minus 19 patient records not available for review = 295
[2] Pesticide not recorded by name
[3] RCB/plasma cholinesterase and gas chromatographic residue analysis

County of Occurrence

One-half of the hospital admitted pesticide poisonings occurred in ten of the state's 46 counties. Florence County had the most cases (26), half of whom were children. Five of the 13 children had been exposed to farm use chemicals. Florence, and five adjoining counties (Horry, Williamsburg, Darlington, Dillon and Marion) in the Pee Dee area account for one-third of the state's pesticide hospitalizations. Richland County led in the non-occupational (n=16) and intentional (n=7) categories. Hampton County had the most admissions (n=9) for occupational poisonings related to agriculture.

Patient Profile

The typical patient was a white male, except in the child category where non-whites were more frequent (Table 2). The average age of children hospitalized was 2.6 years, while the average of the other exposure categories ranged from 30.5 to 44.8 years. Days hospitalized ranged from 2.2 for agricultural associated poisonings to 5.5 for intentional cases, reflecting psychiatric evaluation and longer hospital stay. Only 24 percent of all hospitalizations had specific laboratory tests for pesticide poisoning (RBC or plasma cholinesterase determinations or gas chromatographic pesticide residue analyses). Death was rare, accounting for only 2.2 percent of all cases (Table 3). Of the seven fatalities, only two were intentional.

Table 3
SELECTED TRENDS OF HOSPITALIZED PESTICIDE POISONINGS IN SOUTH CAROLINA

Parameters	*Previous Study*[1]	*Current Study*
Time Period	1971-73	1979-82
Years (n)	3	4
General Care Hospitals (n)	76	74
Cases (n)	117	314
Average Cases/Year	39	78
Deaths (n)	0	7
Case Fatality (%)	0	2.2
Exposure Categories:		
% Occupational	37	25
% Non-Occupational Adult	11	16
% Non-Occupational Child	31	37
% Intentional	18	16
% Undetermined[2]	3	6

[1] Reference 1 (Caldwell and Watson)
[2] Patient records not available for review

DISCUSSION

Cases of pesticide poisoning admitted to South Carolina hospitals doubled in number over a ten-year period, increasing 123 percent as a rate. By contrast state population increased only 20 percent and farms decreased by 35 percent. An average of 39 cases per year was observed in the early 1970's as compared to an average of 78 per year in the present study (Table 3). Non-occupational pesticide poisonings increased by approximately 10 percent to account for more than half of all cases, while occupational cases have decreased from 37 percent to 25 percent. This shift in poisonings suggests the value of pesticide safety training programs in farming and related occupations.

The reason for the increase in number of hospital admissions for pesticide poisoning is not clear. Is it due to greater physician awareness or to more available hospital insurance? Perhaps the use of more toxic organophosphates/carbamates instead of chlorinated insecticides (government restricted in the early 1970's) is a contributing factor. Also the variation between years in the number of pesticide hospitalizations is puzzling; the single year decrease (1982) from a preceding annual average of 86.3 cases per year is unexplained.

For monitoring pesticide morbidity, the importance of complete and accurate hospital records cannot be overemphasized.

Prevention: Ten Recommendations

Clearly most of the poisonings could have been prevented by sensible safety practices:

1. Pesticide containers must be kept in locked storage areas to prevent access by children.
2. Pesticides should never be transferred from original containers to any other containers, especially soft drink and beer bottles.
3. When mixing or handling pesticides (especially organophosphates) unlined neoprene or butyl-rubber gloves should be worn.
4. Long-sleeve shirts and pants of tightly woven material should be worn during mixing and application.
5. Hands should be washed frequently when using pesticides, especially prior to eating, smoking or using the bathroom.
6. If a chemical is spilled on exposed skin, one must bathe immediately using plenty of soap and water. If work clothing becomes contaminated, remove the clothing immediately and bathe.
7. Work clothing contaminated with pesticides should be washed separately from other laundry at least three times before being worn again.
8. Once pesticide poisoning is suspected, any delay in decontamination or treatment will prolong the time for systemic absorption of the toxin.

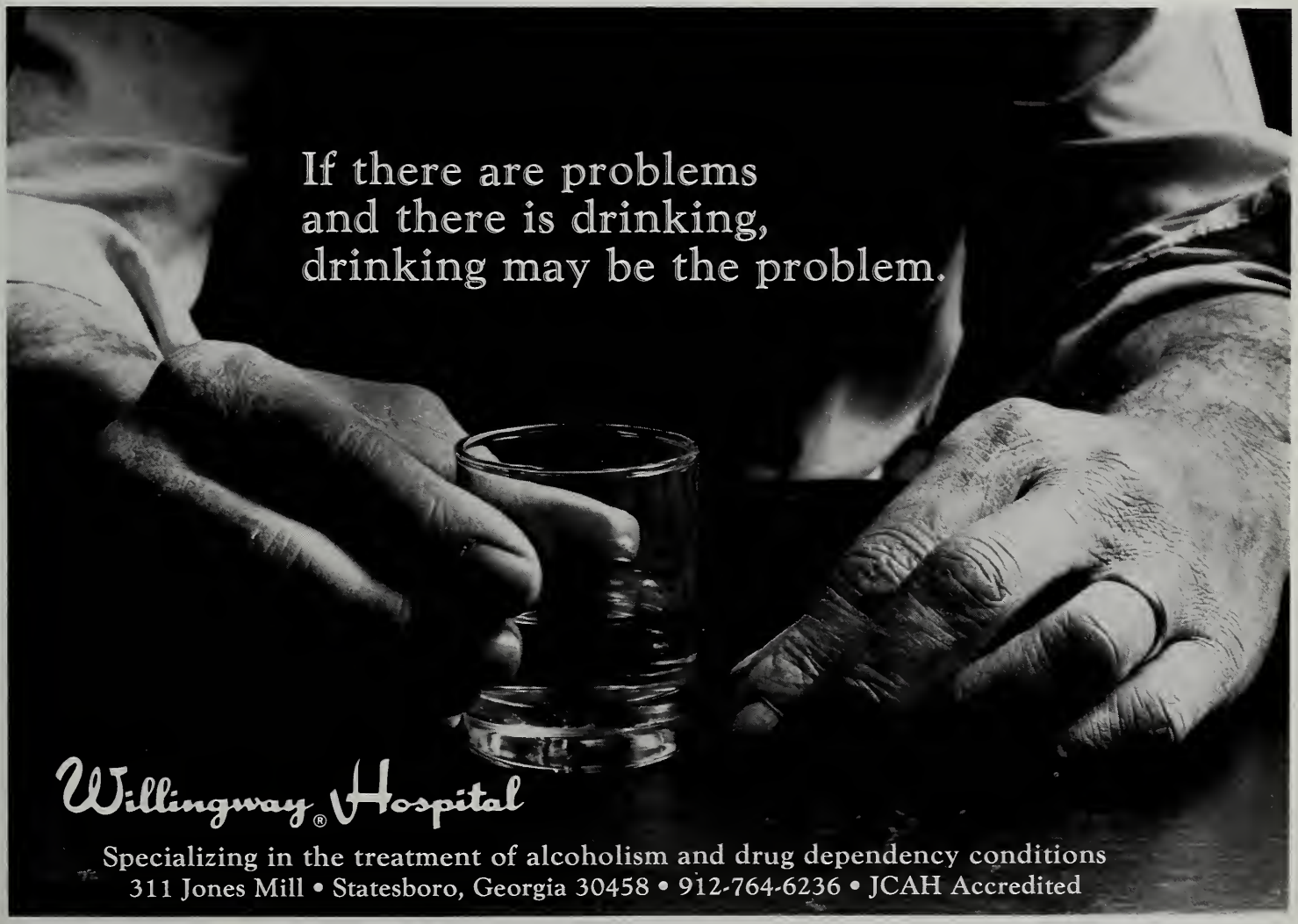
9. The Clemson University Cooperative Extension Service[2] and regional poison control center are valuable resources in identifying chemicals and specific antidotes when these are available.
10. In agriculture there is a trend toward more selective use of pesticides. Integrated Pest Management[3] blends the use of chemicals with biologic and cultural controls. IPM is not only cost effective, but decreases the quantity of pesticides[4] available for accidental poisoning.

SUMMARY

A total of 314 hospitalizations for pesticide poisoning occurred in South Carolina during 1979-1982. Non-occupational poisonings accounted for approximately one-half of the hospitalizations while 25 percent were related to occupation. Intentional poisonings represented 16 percent of the total. Seven deaths (five accidental/two suicidal) occurred during the four year period giving a case fatality of 2.2 percent. The average number of cases hospitalized per year increased from 39 during 1971-73 to 78 in 1979-1982, or a rate increase from 4.5 to 10.1 per 100,000. This trend indicates that prompt treatment and safety practices in the home and on the job must be emphasized. □

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PREVALENCE OF CHLAMYDIA TRACHOMATIS IN WOMEN ATTENDING A FAMILY PLANNING CLINIC: THE NEED FOR A SCREENING SERVICE*

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During the past decade *Chlamydia trachomatis* has been established as an important pathogen of the human genital tract. Long identified as the causative agent of trachoma and lymphogranuloma venereum, this organism has been found to have a wide range of manifestations involving human genital sites. *Chlamydiae* have been shown to be the predominant cause of nongonococcal urethritis (NGU) in males,[1] as well as being an important etiological factor in cervicitis,[2-3] salpingitis,[4] and infertility in women.[5] Additional evidence suggests that *C. trachomatis* has a possible role in cervical atypia[6] and cervical intraepithelial neoplasia.[7] Other research[8-9] has demonstrated that infants born to women with chlamydial cervical infections are at increased risk of developing inclusion conjunctivitis and a distinctive afebrile pneumonitis. Lastly, it has been repeatedly demonstrated that *C. trachomatis* is the most commonly isolated pathogen in persons suffering from sexually transmitted disease.[10-11]

Because of the potential severity of the disease and the risk of ascending infection, prompt, thorough treatment of women with *Chlamydiae*-induced lower genital tract infection is extremely important. Recent evidence suggests that *C. trachomatis* infection in women is not always accompanied by obvious clinical symptoms,[5, 12, 13] yet the possibility of transmission of the agent from these asymptomatic individuals to either infants during passage through the birth canal or to their sexual consorts remains.[12,13] These asymptomatic women then, potentially represent a reservoir of infection for *C. trachomatis*. Consequently, asymptomatic carriage in the female is of great epidemiologic importance. This situation is analagous to that of gonorrhea, where control efforts directed at detecting carriers have been of major importance in controlling the rate of infection in the sexually active population and, to a limited extent, among neonates. The control of chlamydial infections; especially life threatening pneumonitis in children, stillbirth and premature labor; can only be accomplished through programs designed to detect infection. These, of course must be preceded by studies which define the relative risk and rates of prevalence in various populations.

This study was undertaken to assess the prevalence of *C. trachomatis* infections among women attending a publicly subsidized family planning clinic. Additionally, we sought to assess the value of and need for a chlamydial screening service for patients in this setting.

MATERIALS AND METHODS

Women enrolled on the Lancaster County Health Department Family Planning Program (LFPC) receiving their annual, routine gynecologic examination were evaluated in the study. Basic demographic information concerning race, age, and marital status was gathered prior to physical examination.

Samples for *Chlamydiae* cultures were obtained from the endocervix using a sterile cotton swab. The 2SP transport medium was then inoculated with the swab and refrigerated at 4°C. Specimens were shipped on dry ice within 24 hours to the Virology Section, Bureau of Laboratories, South Carolina Department of Health and Environmental Control for culture.

Specimens were inoculated onto cycloheximide treated McCoy cell monolayers by centrifugation. Cell cultures were incubated for 48 to 72 hours at 37°C. Following incubation, the monolayers were stained with iodine and examined microscopically for the presence of inclusions.

Cervical samples were collected for *Neisseria gonorrhoeae*, on (1) all patients under the age of

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24, (2) those with positive cultures for *C. trachomatis* and (3) those with symptoms suggestive of lower genital tract infection, in accordance with established protocols. Vaginal wet mount preparations were examined for *Trichomonas vaginalis*, clue cells and *Candida albicans* as indicated. Cultures for Herpes simplex virus were obtained as indicated. Patients with positive tests for either *Neisseria gonorrhoeae* or *C. trachomatis* were tested for syphilis by the Rapid Plasma Reagin Test (RPR) and Fluorescent Treponemal Antibody-Absorption Test (FTA-ABS).

RESULTS

One hundred eighty-seven women were evaluated and tested for *C. trachomatis* infection. All women under the age of 24 or women with positive test for *C. trachomatis* or with lower genital symptoms (n=148) were cultured for *Neisseria gonorrhoeae*. Thirty-two women, with either positive tests for *C. trachomatis* or *N. gonorrhoeae* were tested for syphilis.

Of the 187 women studied 103 (55.1 percent) were Black; the remainder White. No Asian, native Americans or Hispanics were known to have participated. The age of the participants ranged from 14-43 years, with the mean age being 22.7 years and the median age equal to 22 (Table I).

C. trachomatis was isolated from 31 (16.6 percent) of the women studied. Black females had a 21.3 percent (22/103) isolation rate compared with a 10.7 percent (9/84) rate among Whites. There was no statistical association between race and a positive test for *Chlamydiae* (Chi-square = 3.06, 1 df, p = 0.0515). We found no statistically significant association between age group and the isolation of the organism (Chi-square = 6.547, 6 df, p = 0.3648).

N. gonorrhoeae was isolated from 4.7 percent (7/148) of the women cultured for this organism (Table II). Thirty-two women, with positive tests for *C. trachomatis* and/or *N. gonorrhoeae* were tested for syphilis and two (6.3 percent) were diagnosed with secondary syphilis.

Data on STD co-infection were as follows: (1) Twenty-five of the women were infected with *C. trachomatis* only (Table III); (2) Of the seven women with gonococcal infections six (87.5 percent) had concomitant chlamydial infections; (3) Both women with syphilis had simultaneous gonococcal and chlamydial infections.

TABLE I
Chlamydial Isolation Rate by Age Group and Race

Age Group	*White*	*Black*	*Total*
Under 15	0/0 (0.0%)	0/1 (0.0%)	0/1 (0.0%)
15-19	1/22 (4.5%)	10/20 (50%)	11/42 (26.2%)
20-24	6/39 (15.4%)	7/24 (29.2%)	13/63 (20.6%)
25-29	0/16 (0.0)	3/22 (13.6%)	3/38 (7.9%)
30-34	2/6 (33.3%)	1/2 (50.0%)	3/8 (37.5%)
35-39	0.1 (0.0%)	0/2 (0.0)	0/3 (0.0%)
Over 40	0/0 (0.0%)	1/1 (100%)	1/1 (100%)
TOTAL	9/84 (10.7%)	22/103 (21.3%)	31/187 (16.6%)

TABLE II
Positive Test Results for *C. trachomatis*, *N. gonorrhoeae* and Syphilis Among Those Tested.

	Number	*Number Tested*	*Isolation Rate*
C. trachomatis	31	187	16.6%
N. gonorrhoeae	7	148	4.7%
Syphilis	2	32	6.3%

TABLE III
Test Results of Patients with One or More Sexually Transmitted Disease

C. trachomatis only	25	13.4%
N. gonorrhoeae only	1	0.5%
C. trachomatis and only *N. gonorrhoeae*	4	2.1%
C. trachomatis, *N. gonorrhoeae* and syphilis	2	1.1%
C. trachomatis and *N. gonorrhoeae*, and syphilis negative	155	82.9%
TOTAL n =	187	(100.0%)

DISCUSSION

The overall prevalence of chlamydial infections of the cervix in women attending LCFPC (16.6 percent) is similar to that in earlier reports describing the prevalence of the organism among women in other populations. We were unable to find a statistical association between race or age group with a positive test for *C. trachomatis*. Despite the apparently dissimilar isolation rates between white (10.7 percent) and black (21.3 percent) females, Chi-square analysis revealed this apparent association to be within the realm of error ($p > 0.0515$), and hence not a statistically significant association. Hence, we were unable to

corroborate the work of other researchers which has showed younger age and Black race to be statistically associated with the isolation of *C. trachomatis*. In general terms then, neither of these variables were shown to be statistically significant predictors of chlamydial infections in our study population. These findings, coupled with the fact that the women studied were not attending a sexually transmitted disease clinic (nor were they being examined for any specific complaint) underscored the pervasiveness of the organism among the sexually active female population. Indeed, at presentation to the clinic only four (2.1 percent) women had specific gynecologic complaints suggestive of chlamydial infection; the other 183 (97.9 percent) were symptom free.

In the same vein, our findings that the percentage of *Chlamydiae*-positive women was approximately four times greater than that of women with *N. gonorrhoeae* corroborates the claim of many researchers that *C. trachomatis* is the most ubiquitous of all the agents of sexually transmitted disease.[1, 3]

Many other studies have implicated high numbers of sex partners as a risk factor for *C. trachomatis* infection. Number of sex partners was not assessed due to inadequate resources, and because it is our opinion that proper definition of "multiple sex partners" as a variable requires at least second generation assessment of sex partners. In other words, merely establishing the number of sex partners of the infected female may not be as accurate a gauge of risk for the organism as an evaluation of the number of sex partners of her sex partners. For example, a female with only one sex partner would be adjudged to be at low risk for infection according to some authorities. Her risk for infection with *C. trachomatis* is significantly increased should her sole partner be sexually involved with several other individuals.

Other studies have shown that individuals infected with *N. gonorrhoeae* are at risk for concomitant infection with *C. trachomatis*. Our findings that 87.5 percent of the women with gonococcal infection had concurrent chlamydial infections is of major importance. This represents the highest degree of gonococcal and chlamydial infections in women reported in the literature to date. The medical community needs to be more aware and concerned about infection in females with both these organisms since they have been shown to be capable of causing serious sequelae; including, but not limited to, pelvic inflammatory disease, tubal infertility, stillbirth, premature labor, and complication in newborns as a result of passage through the birth canal. Furthermore, it has been shown that commonly used anti-gonococcal agents (e.g. penicillin, second generation cephalosporins and spectinomycin) have little or no anti-chlamydial effect. The situation is further complicated by studies which have shown both organisms, particularly *C. trachomatis*, to be capable of producing asymptomatic infections in women.

Given these factors — the pervasiveness of the *C. trachomatis*, the high probability of concomitant infection in women with gonococcal infections, the necessity to use other drugs, the potentially serious consequences of undetected and untreated chlamydial infections, and the high degree inapparent infection, it is clear that changes are needed in the screening and management of women at risk for exposure to this agent.

Ideally, culturing for the presence of *C. trachomatis* should become part of the routine gynecologic examination of women of reproductive age in much the same manner that Pap smears and gonorrhoea cultures are currently integral parts of standard gynecologic care. Two new tests for *C. trachomatis* are now widely available which are both significantly lower in cost, technically much simpler to collect and transport, and of reasonable sensitivity and specificity for widespread use. These are the enzyme-linked immunoassay test (ELISA) and the fluorescein-conjugated monoclonal antibody test. Based on the data presented here, there is good reason to recommend doing *routine* chlamydial screening in the general South Carolina female population of reproductive age in general at the time of the routine interval (annual or bi-annual) gynecologic exam. *This screening should not be limited to the young, black population as other research has previously implied.*

The logical correlate of such large scale screening would be that chlamydial infection should be a Class II reportable disease (by telephone or card to the local health department) in South Carolina. This would serve two main purposes: first, it would provide an overall surveillance system which is an important step in increasing disease awareness and initiating epidemiologic control measures; second, it would help reduce the morbidity among the obstetrical and neonatal popula-

tion by decreasing infection in pregnant women and their partners. Additional consideration should be given to prenatal screening at 18 to 20 weeks gestation and again at 36 weeks, but this is an area that requires further study.

Finally, with the high percentage of concomitant gonococcal and *C. trachomatis* infection seen in this study, gonococcal PID treatment in women should certainly be followed with an anti-chlamydial treatment (tetracycline or erythromycin). The 1982 CDC STD treatment guidelines have suggested this regimen and the new 1985 guidelines will be more emphatic. Some practitioners may be inclined to withhold the anti-chlamydial treatment in asymptomatic GC positive female cases and instead do a chlamydia culture at the time of the GC test-of-cure. This is certainly a reasonable alternative, given the much lower cost of the ELISA and fluorescein-conjugated monoclonal antibody tests now available. Sexual abstinence or condom use should be recommended in this situation until the chlamydia test result report is received. For the patient who, in the practitioner's opinion, is not likely to adhere to these recommendations for sexual behavior, empirical anti-chlamydial treatment as an asymptomatic co-infection, in light of the findings in this study, is strongly recommended.

In the persistent or recurrent chlamydial infection in female patients, evaluation of the sex partner(s) for asymtomatic *C. trachomatis* infection is recommended. If the less expensive *C. trachomatis* tests could not be afforded, "epidemiologic treatment" of the first generation sex partner(s) as is currently done with syphilis and gonorrhea, is suggested based on the prevalence findings in our study.

CONCLUSION

This study has underscored the ubiquitousness of *C. trachomatis* in the female population. The women screened were neither attending a sexually transmitted disease clinic, nor were they being examined because of any specific complaint. Rather they were examined as part of their routine gynecologic testing at our clinic. That 31 (16.6 percent) of these women were infected emphasizes the need for screening for *C. trachomatis* as part of the routine gynecologic examination of all women.

In this study we have found neither age nor race to be statistically significant variables in predicting infection. These findings support the contention that the organism is more widespread in the general population than any other agent of sexually transmitted disease. In our series, there were over four times as many successful isolates of *C. trachomatis* as there were of *N. gonorrhoeae* (31 vs. seven).

These findings, when coupled with the serious sequelae of ascending chlamydial infection clearly demonstrate the need to provide routine screening for female patients.

It is our intention to begin the routine screening of all patients under age 25 seeking care at our family planning clinics for *C. trachomatis*. For those over 25, we intend to screen those women who plan future pregnancies (especially those in this group who are nulliparous). We are currently giving strong consideration to routine chlamydia screening in our obstetric population, in particular, high risk patients and those at risk for premature labor (as defined by the current DHEC RPL scoring system).

Other practitioners are advised to consider similar screening practice in their patient populations.

SUMMARY

Chlamydia trachomatis was isolated from 31 (16.6 percent) of 187 women attending a publicly subsidized Family Planning clinic. Neither age (Chi-square = 6.55, 6 d.f., p = 0.3648) nor race (Chi-square = 3.06, 1 d.f., p = 0.0515) was found to be a statistically significant predictor of a positive test for the organism.

Neisseria gonorrhoeae was isolated in seven women, six (87.5 percent) of whom had concurrent chlamydial infection.

Among the 31 women with *C. trachomatis*, none had symptoms suggestive of cervical infection. Hence, in the absence of a screening service, the infection of these women would have been undiagnosed and untreated. The need for a screening service is discussed. □

ACKNOWLEDGEMENTS

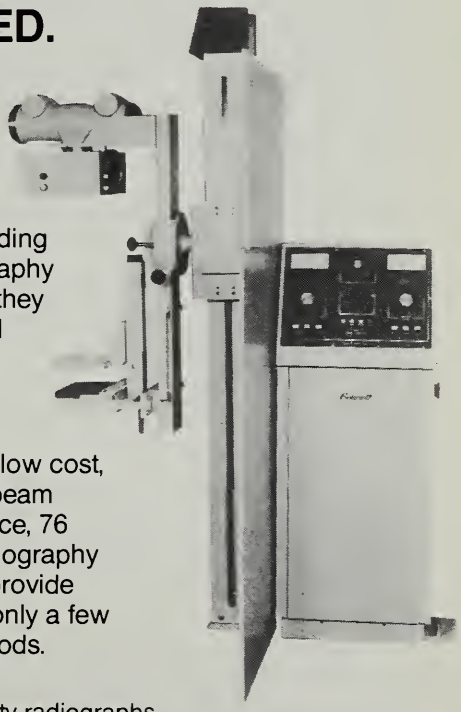
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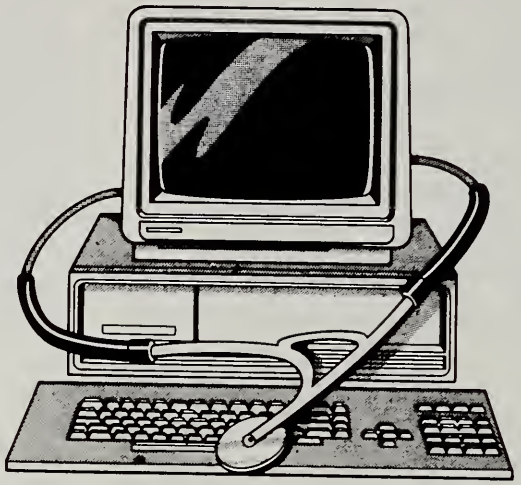
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THE AMA INTERIM MEETING — TUCKER'S SWAN SONG

JOHN C. HAWK, JR., M.D., DELEGATE*

For the SCMA Delegation, the Interim Meeting of the AMA House of Delegates in Washington, D.C. December 6-11, was a time of sadness, regret, and a sense of loss on the one hand, while at the same time we were filled with joy, pride and a feeling of accomplishment.

We were all constantly aware of the absence of Leonard Douglas and Mary Anne. Leonard's untimely death deprived us not only of our State President but also an Alternate Delegate to the AMA who has served well since January, 1983. Many officers of the AMA and Delegates expressed to us their sense of loss also and sent condolences to Leonard's family. An appropriate Memorial Resolution was presented to the House.

We also were sad and empty at the thought that this was the last House of Delegates meeting for Tucker Weston, who has served as Alternate or Delegate since 1975, and who has been Chairman of our Delegation for seven years. Tucker had decided last April not to offer for reelection as Delegate and therefore was attending his last meeting.

The South Carolina Delegation had an open hospitality room on Saturday evening and we were overwhelmed by the number who visited our suite, estimated as over 800. It could all be attributed to the fact that on our printed invitations we wrote in "Tucker's Retiring" and therefore they came by to shake his hand and tell him how much he will be missed. Some expressed near disbelief that he would step down at this time, and we let all of them be assured that this was not our Association's or Delegation's decision but his.

Tucker has left a lasting impression at the House of Delegates. His forthright presentations at Reference Committees and on the House floor, his able chairing of Reference Committees on several occasions, his booming voice, towering personage, outgoing manner and his remarkable capabilities as a campaign manager will long be remembered. I am personally indebted to him for his direction of my successful campaigns for election to the Council on Constitution and Bylaws in 1979, 1982 and 1985. It was also in great measure through his efforts that Stewart Haskins was elected to the resident's slot on the Council on Medical Service and Michael Hall to the resident's position on the Council on Scientific Affairs in 1980.

At the AMA, Tucker has served also as President of the *Aces and Deuces* (organization of states with one or two delegates), and as Chairman of the Southeastern Delegation.

SCMA DELEGATION

In addition to Tucker Weston, the SCMA was represented at the Interim Meeting by Waitus Tanner and John Hawk, Delegates; Euta Colvin, Randy Smoak, and Charlie Duncan, Alternate Delegates; Ken Owens, Immediate Past President; John Simmons, Secretary; Gavin Appleby, President; Walt Roberts, President-Elect, and Don Kilgore, Delegate-Elect to replace Tucker Weston. Bill Mahon and Bill Watson attended as staff members.

We were also pleased to have Saundra Smoak, Patsy Simmons, Dorothy Colvin, and Nancy Hawk attending with us. Robert H. Taylor, President-Elect of the Academy of Family Physicians, was present for much of the meeting.

As usual the House of Delegates had a full agenda, considering 73 reports and 123 resolutions. Most of these have been summarized in considerable detail in the December 20th issue of the *American Medical News*, readily available to you. I would like to hit a few highlights of interest to us in South Carolina.

SOUTH CAROLINA RESOLUTIONS

Two resolutions were submitted by the South Carolina Delegation. The first, Resolution 33, cited the problems which community hospitals face in the current competitive cost containment

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environment, leading in many cases to the take-over of these hospitals by "for profit" chains. It recognized that coalitions have been established, such as the Voluntary Hospitals of America, to meet these issues, but stated that they have not as yet obtained significant success in providing adequate support for the hospitals. The Resolution asked that the AMA set up a Task Force to "evaluate the current support systems available to not-for-profit and other community hospitals, determine the role which the AMA could play in such efforts, and if determined to be feasible proceed with setting up such a support system or encouraging and facilitating existing systems."

The Reference Committee recommended and the House concurred that this resolution should *not* be adopted. Concern was expressed in the reference committee hearings about the negative light that this would cast upon proprietary hospitals. There was also comment from the HMSS Governing Council which had considered a similar resolution in 1984. The Reference Committee felt that the proper role of the AMA should be "to provide assistance and directions to *physicians* in a changing medical practice environment, to promote quality patient care and to continue to recognize pluralism in medicine."

The other South Carolina Resolution, Resolution 34, asked the AMA to urge the U.S. Congress to (1) restructure the Medicare law to exclude those working patients over 65 who have medical insurance, (2) guarantee every patient over 65 may continue his/her medical insurance at a reasonable rate upon retirement, (3) guarantee catastrophic coverage regardless of income, (4) use the funds saved to improve Medicare coverage for the patient and (5) abolish the individual physician profile and replace this with reimbursement to all physician providers of medical care on the basis of service only. This was discussed in considerable detail and the Reference Committee recommended that it be referred to the Board of Trustees for further study and action. The House concurred.

MEDIA ATTENTION

Probably the greatest media attention was focused on discussions of the subject of AIDS and to the AMA position on smoking.

The House adopted a report describing an AMA action plan to disseminate information about AIDS to physicians and to establish physicians as the most credible accessible source of AIDS information. In the report it was noted that:

- As of October, 1985, over 14,000 cases of AIDS had been reported.
- Over 1,000,000 persons are estimated to be infected with AIDS retrovirus.
- AIDS has the potential of becoming the major lethal pandemic of the century.

In regard to tobacco, the AMA continued to strengthen the Association's position against cigarette smoking and the use of other tobacco products, such as snuff and chewing tobacco. The delegates overwhelmingly supported a number of new policies, aimed at reducing death and disease caused by tobacco, including the following:

- A ban on all magazine, newspaper and billboard advertising of tobacco products through federal legislation.
- Increased participation by physicians in educating the public about the health hazards of tobacco.
- Improved publicity about the adverse health effects of snuff and chewing tobacco.
- Encouragement of government authorities to label all smokeless tobacco as a major health hazard.

MEDICARE FEE FREEZE

The House of Delegates took a number of actions in an attempt to gain some measure of relief from the continuing Medicare fee freeze. These included:

- A resolution urging county, state, and specialty medical societies to help the AMA in continuing an aggressive activity, both legislative and judicial as appropriate, to eliminate the discriminatory action of Congress in imposing an unfair *control of charges* for physician services under Medicare.
- A policy directing the AMA to intensify efforts to increase public awareness of the deleterious effects of the Medicare fee freeze on continued accessibility to physicians of the patient's choice.
- A resolution asking the AMA to continue to oppose and seek repeal of the unnecessary attestation statement on hospital medical records of all Medicare beneficiaries.

Professional liability was also the subject of intense discussion. The Special Task Force on

Liability Problems reported on its major activities in four areas:

1. Education and community action.
2. Legislation.
3. Defense coordination including the use of a toll free hotline.
4. Risk control/quality assurance activity.

The House directed that the search for solutions to the liability crisis continue as the highest priority of the Association.

At the opening ceremonies, Dr. Harrison L. Rogers, President, urged an optimistic attitude toward the future, stating "that negative attitudes are more dangerous to the future of the medical profession than anything that is being imposed or anything that can be imposed on us." He asked for continuing efforts by all Association members to improve physician-patient relationships.

UNIFIED MEMBERSHIP

As has been publicized in the *AM News* and elsewhere, several state and county medical societies and one specialty society have voted during the past year to have Unified Membership, that is, any physician joining the state or local society would also be required to become a member of the AMA. The newly unified states are Delaware, Kansas, Virginia and Mississippi, joining Oklahoma and Illinois. The House considered Board of Trustees Report DD which outlines a vigorous program to increase AMA membership and to encourage state societies and also specialty societies to adopt unified membership. The House adopted the Board recommendation which would provide the following benefits to state associations and their members when unification is adopted:

1. First year in practice, second year in practice, military and full dues paid AMA members who are members of unified societies receive a 10 percent discount on AMA dues effective for the 1985 membership year;

2. The AMA provides unified state societies with reimbursement for collection of AMA dues at a rate of three percent of dues received by January 15, 2.5 percent of dues received by February 15, and 2.0 percent of dues received by March 15 of each year, beginning in 1985; and

3. Effective immediately the AMA extends to unified societies the services of its staff on special projects which are mutually agreeable to the unified society and the AMA, within the limits of staff and resource availability.

The above are in addition to the benefits previously approved for unified state societies which include: (1) two additional delegates in the AMA House by virtue of their unified status; and (2) the AMA underwrites the entire cost of professional telemarketing delinquency renewal efforts conducted by unified state medical societies.

Your delegation and the SCMA Board of Trustees have discussed this new program and will continue to gather information and will report to the SCMA in the future.

In the meantime, the South Carolina Delegation to the AMA urges all physicians to take a more active role in organized medicine and thus to play a part in shaping the future of medical care in these critical times:

1. If you are not already a member of the AMA, please join.
2. Come to the Hospital Medical Staff Section meetings and to the meetings of the AMA House of Delegates whenever your schedule permits. You may participate actively by speaking at Reference Committees, expressing your views on important issues.
3. Give your input to any member of our Delegation at any time. If you are at an AMA meeting, you are welcome to attend our Delegation Caucuses.

All the members of the Delegation consider it a privilege to serve the SCMA. In order to represent you properly, we need and solicit your input. At our final caucus in Washington, I was honored by being elected as Chairman of the Delegation and Randy Smoak was elected as Vice-Chairman. We are particularly anxious to be responsive to the physicians of our state.

One final word, addressed primarily to our outgoing Chairman:

Tucker, we hate to see you drop out of the Delegation, and will miss you greatly. Thank you for all you have done to put South Carolina "on the map" at the AMA House of Delegates. □

Editorials

Care of patients with coronary artery disease has become increasingly specialized. Two articles in this issue of The Journal *describe new approaches. In the first, Dr. Morse and colleagues from Anderson analyze the use of intravenous streptokinase for acute myocardial infarction in the community hospital setting. In the second article, Dr. James and colleagues describe a novel approach to refractory angina pectoris: the use of more than one calcium channel blocking agent. Readers should be aware that both of these new approaches are fraught with potential complications.*

In the editorials below, Dr. Michael Assey discusses the use of streptokinase in acute myocardial infarction, while Dr. Christie B. Hopkins addresses the problem of refractory angina pectoris.

— CSB

INTRAVENOUS STREPTOKINASE: A STEP FORWARD BUT STILL NOT THERE

There continues to be a high level of interest in the use of thrombolytic agents to prevent or minimize myocardial damage in acute myocardial infarction. This article by Morris and colleagues in this month's issue of *The Journal* is important for two reasons. Like many previous publications, it underscores the relative safety and efficacy of intravenous streptokinase when used in properly selected patients. More importantly, it illustrates the applicability of this approach, developed in tertiary care centers with large supporting technical casts, to primary care centers in our own state. The investigators spent considerable time in developing the protocol, enlisting the advice of national experts in the field of thrombolytic therapy. They then modified the protocol to remain consistent with the abilities and limitations of their particular medical center.

Intravenous streptokinase is not new, in fact pooled data from several studies performed in Europe between 1969 and 1979 have shown a reduction in mortality when given to the patients with acute myocardial infarction. In these trials the dose of streptokinase used was quite low (250,000 units load plus 100,000 units per hour) and the methodology was variable. Most current protocols utilize an intravenous infusion rate of 25,000 units per minute, with a total dose ranging from 500,000 to 1.5 million units. Successful thrombolysis is non-invasively indicated by pain relief (often sudden and complete), normalizing of ST segment shifts, reperfusion arrhythmias (most frequently accelerated idioventricular rhythm) and the early (wash out) appearance of cardiac enzymes.

The authors report 28 survivors of intravenous thrombolytic therapy, 26 of whom received coronary arteriography within 10 days of treatment. At cardiac catheterization the "infarcted vessel" was patent in 22 (85 percent). This success rate for intravenous streptokinase is higher than most published reports that have utilized coronary arteriography to assess success of thrombolytic therapy. This higher success rate results from the inclusion of successfully treated patients as well as those unsuccessfully treated who went on to have spontaneous lysis of the thrombosed vessel. Studies of the natural history of untreated patients, had demonstrated a spontaneous recannalization rate of 40-50%, not unlike the success rate for most reported intravenous streptokinase studies.

The administration of streptokinase directly into the thrombosed coronary artery has several advantages over the intravenous route of the administration. Intracoronary methodology is more effective, with success rates in the 75 percent range, compared to 50 percent success rates reported by most studies. Because a larger amount of thrombolytic agent is delivered nearer to the site of the thrombus, the degree of systemic

thrombolysis should be less (although not insignificant) hence fewer systemic side effects (particularly bleeding) should be manifested. This may only be a theoretical consideration, in that most published studies comparing intracoronary and intravenous administration the major bleeding episodes have occurred with similar frequency. Intracoronary administration provides knowledge of the coronary anatomy, permitting coronary artery bypass surgery or percutaneous transluminal coronary angioplasty when patients are left with high grade stenoses following successful thrombolysis. Finally, intracoronary streptokinase has been approved by the Food and Drug Administration, while intravenous streptokinase still has not been approved for use in acute myocardial infarction. Despite these apparent disadvantages, intravenous streptokinase does not require catheterization laboratory, thus can be extended to the large number of primary care facilities which receive the bulk of patients with acute myocardial infarction. Furthermore, intravenous streptokinase can be given earlier in the course of the patient's evolving infarction thereby salvaging more myocardium which should translate into a decreased morbidity and mortality.

The title of this editorial reflects my belief that intravenous streptokinase alone does not constitute definitive therapy for acute myocardial infarction. The drug itself is far from an ideal agent in that it is antigenic and induces a generalized lytic state. Perhaps more recently developed agents such as tissue-specific plasminogen activator, which attack freshly formed thrombi much like a heat-seeking missile, will be more efficacious and safe than systemic streptokinase. This will still only represent the first step in total reperfusion of the ischemic myocardium, since the vast majority of patients, even after successful thrombolysis, will be left with high grade obstructive lesions requiring surgery or angioplasty.

Accordingly, I would recommend that community hospitals in our state considering the institution of intravenous streptokinase or tissue-specific plasminogen activator, develop their protocols in concert with regional tertiary care centers, that can provide the needed follow-up steps that would result in total myocardial reperfusion. The primary care facilities must remain the initial site of thrombolysis, since in most cases patients could not be transported, even by helicopter, to a tertiary care center soon enough after the onset of their infarction to salvage significant myocardium. The authors report that Anderson Memorial Hospital treats over 300 patients with acute myocardial infarction each year. Yet between January, 1983 and July, 1985 (a period of 18 months) only 35 patients were deemed eligible for intravenous streptokinase. I suspect the major reason for exclusion was the arrival of the patient at the emergency room too late to benefit from even intravenous streptokinase. This indicates that the general population must be informed of the availability of this form of therapy in their local communities if such treatment is to have any significant economic and functional impact on the epidemic of coronary artery disease in our state.

A better informed population, arriving earlier at their community hospital, can then be properly screened and intravenous thrombolytic agents initiated when indicated. These patients, when stable, should then be referred to the appropriate tertiary care center for coronary arteriography and definitive therapy. Cooperation between the physician caring for the patient at the primary care center and the tertiary center receiving the patient must be maximal to minimize untoward events known to be associated with this aggressive form of therapy.

Michael E. Assey, M.D.
Associate Professor, Medical University of South Carolina and Director, Adult Cardiac Catheterization Laboratories, MUSC Teaching Hospitals, Charleston, S. C.

ANGINA PECTORIS — PAYMENT DEFERRED?

Enormous advances in the management of patients with symptomatic coronary-artery disease have been made in the past 20 years. Beta-receptor blockade was introduced in this country with propranolol as an investigational drug in 1966. The cardioprotective effect of several beta-blocking agents, in patients following myocardial infarction, has subsequently been demonstrated. Widespread use of stress testing and coronary angiography has afforded early identification of severe proximal coronary disease followed by life-prolonging coronary bypass surgery. Patients with ischemic disease and angina probably live longer today than 20 years ago.[1, 2]

Despite these therapies, the basic process of coronary atherosclerosis continues to advance, with the result that many patients have severe, diffuse involvement of their coronaries.[3] I believe we are seeing more and more patients with recurrent, refractory angina, who pose extremely difficult problems in management. In this issue of *The Journal*, James, Leman and Assey[4] demonstrate that calcium channel blocking agents, when used in combination, can safely and effectively improve symptoms in many of these unfortunate patients. These authors demonstrate that, while serious side effects (congestive heart failure and high-grade AV block) are a concern with these agents, reasonable control of previously refractory angina may safely be achieved. I would like to emphasize that the dosage of the prior medications be reduced (as these medications have, in a sense, failed) in order to "make room" for the potentially more effective calcium blockers. If this is not done, side effects are more likely. These side effects will then be blamed on the newer medication, when in fact they may be due to several agents acting together.

As patients with angina may now be expected to live 15 to 20 years after the onset of their symptoms, I would encourage their physicians to aggressively attempt risk factor reduction in these individuals, in order to slow the predictable progression of the atherosclerotic process.[5, 6]

No patient with coronary heart disease should smoke. The beneficial effects of diet, stress management, exercise, and blood pressure control are less clear in secondary prevention, as no good long-term studies are currently available. If the underlying disease took 30 years to develop, however, then aggressive risk factor modification for the next 15 years should help some patients significantly.

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OF MOTORCYCLES AND HELMETS

In the November 1985 issue of *The Journal*, Drs. Terrance P. McHugh and James I. Raymond reported an analysis of motorcycle accident statistics in South Carolina for the period 1965-1984.[1] They noted a significant increase in fatalities following the modification of South Carolina's helmet law in 1980. Noting that the General Assembly is considering mandatory seatbelt laws, they concluded that the time may be appropriate "To restudy the entire issue of motorcycle helmet usage."

These conclusions are challenged in this issue by two letters to the editor. The first of these was written by a physician who characterizes himself as a non-motorcycle riding libertarian. The second author is the state co-ordinator of an organiza-

tion known as ABATE. I confess that I do not know what the acronym represents: however, the organization's stationery proclaims it to be "dedicated to freedom of the road." The latter writer asserts that the study by Drs. McHugh and Raymond is so unsound that it places "serious doubt on the credibility and integrity of *The Journal of the South Carolina Medical Association.*"

A classic Pandora's box, the issue of motorcycle helmet law will continue to evoke controversy. Clearly, no editorial can reconcile the strong feelings expressed by holders of such opposing viewpoints. I shall make three brief comments.

First, our journal holds as a major priority for publication "information uniquely pertinent to the health care of South Carolinians" (see Information for Authors elsewhere in this issue). The article by Drs. McHugh and Raymond clearly met this desideratum. In addition, it continues to be our philosophy that state medical journals "do not represent an appropriate forum for research findings of a specialized nature." Drs. McHugh and Raymond referred appropriately to a detailed, independent study carried out by Dr. John M. Maloney and co-workers at DHEC.[2] These authors conducted a detailed hospital chart review of 180 patients hospitalized after motorcycle accidents in South Carolina. Using an appropriate multiple logistic regression model, they concluded that the absence of a helmet was significantly correlated with the risk of being killed in such an accident ($p = 0.03$).

Second, it would appear that the two letter writers are unlikely to be dissuaded by any statistical analysis of this important problem. Beneath their arguments appears to be the much larger philosophic issue of individual freedom versus the best interests of society. An opposing argument can be made that failure to wear helmets (or seatbelts, for that matter) transgresses the rights of others. If the South Carolina data are valid (as they seem to be), then it is reasonable to assume that unhelmeted motorcyclists increase the cost of medical care, adding to everyone's tax burdens and insurance premiums. Persons unfortunate enough to be party to accidents involving such motorcyclists are likely to experience greater financial and emotional trauma as a consequence.

Finally, it behooves all of us, as physicians, to become involved in such many-sided societal issues. Drs. McHugh and Raymond are neither armchair philosophers nor sign-carrying demonstrators. They are emergency room physicians. They see . . . on a daily basis . . . the awful consequences of highway trauma. This involvement, in my opinion, confers credibility far beyond the actual merits of their data. Each trauma victim makes one more appreciative of the efforts of safety experts such as Mr. Talmadge Legrand of the South Carolina Department of Highways and Public Transportation. The ABATE coordinator appears to criticize, somewhat obliquely, Mr. Legrand's efforts. Having known Mr. Legrand for nearly 30 years, I continue to be impressed by his untiring efforts to save the lives of South Carolinians. I suspect that the efforts of Mr. Legrand and others like him to prevent trauma on our highways far surpass our own efforts to prevent such lesser evils such as endocarditis, rheumatic fever, malaria, hepatitis B, and urinary tract infection!

The Journal welcomes controversy. Therefore, we thank the two letter writers for expressing their concerns. However, we must conclude that physicians like Drs. McHugh and Raymond fulfill what we consider to be among the highest priorities of organized medicine: making our opinions known in the legislative arena, acting in what we believe to be the best interests of society.

— CSB

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PHYSICIAN RECOGNITION AWARDS

The following SCMA members are recent recipients of the AMA's Physician Recognition Award. This award is official documentation of Continuing Medical Education hours earned.

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Frederick W. Clevenger, M.D.
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Vol. 6, Issue No. 2 February 1986

HOW MUCH DO YOU KNOW ABOUT IRAS?

What you don't know can lose you money.

Since 1982 when they were first made available to every working American, Individual Retirement Accounts have attracted almost $200 billion in assets. No wonder every bank, brokerage firm, insurance company and mutual fund group is spending a fortune in advertising dollars trying to convince you that its IRA is best.

And yet, with all the ballyhoo about IRAs in the past several years, it's surprising how little people actually know about this program. In fact, there are still folks out there who think IRAs are investments, not retirement plans. And there are others who are convinced that if you don't have $2000, you can't participate.

Let's see how IRA-astute you are. Take this short quiz and find out what you do and don't know about IRAs. The answer may surprise you.

Section I: The IRA at Work.

Q. What are the minimum and maximum IRA annual contributions?

A. There is no minimum. You can contribute as little or as much as you'd like so long as you don't exceed the $2000 annual maximum (provided, of course, you've earned that much).

Q. How many IRAs can you have?

A. As many as you'd like. So long as you don't contribute more than $2000 in total each year, you may maintain IRAs at banks, brokerage firms and other financial institutions. Therefore, if your IRA is currently at a bank, you can establish a new IRA for this year at Hutton. Once you've established an IRA, you're under no obligation to continue contributing to it every year or keeping it at the same financial institution.

Q. What is the deadline for IRA contributions?

A. April 15th. But procrastinating can be a costly mistake; making your contribution early can add up to a sizeable sum by the time you start withdrawing funds. Assuming you invested $2000 annually on January 1 and achieved a 12% return, you might actually find yourself more than $80,000 richer after 30 years than you would be if you had waited until April 15th to make your contribution.

Q. When can you take money out of an IRA?

A. You may begin making penalty-free withdrawals from your IRA at the age of 59 1/2 withdrawals are taxed as ordinary income - and you must begin in the year in which you turn 70 1/2. (Premature withdrawals are subject to an additional penalty of 10%). But because your IRA contributions accumulate on a tax-deferred basis, don't

think you're locking up your money. Rather, look at IRAs as a way of locking in an attractive yield. What's more, even after you have begun making withdrawals, your untouched assets continue to grow tax-free.

Q. How are IRA distributions made?

A. In installments based on your life expectancy or the joint life expectancy of you and your spouse. (The IRS provides tables of life expectancy and joint life expectancy for this purpose.) However, if you begin making withdrawals before age 70 1/2, the installments may be spread over a shorter period of time.

Section II: True or False.

Q. A self-directed IRA is expensive.

A. False. Not at Hutton. In fact, you may establish your self-directed IRA for an annual custodial fee of only $25 - one of the lowest in the financial services industry. And, you may continue to maintain your self-directed account even if you choose to invest your IRA contribution one year in a mutual fund or other vehicle that employs the service of a different custodian.

Q. The tax deduction is the most important benefit of the IRA.

A. False. Tax savings is just one of the advantages to establishing an IRA. More importantly, your contributions accumulate on a tax-free basis until you begin making withdrawals. How does this benefit you? Suppose you fund an IRA with a $2000 investment which yields 12% per year. Over a 30-year period, that investment (compounded annually) would grow to $540,585. If you invested $2000 in a taxable investment with the same yield over the same period and you were in the 40% bracket, you would have only $125,976 or less than one-fourth of that amount.

Section III: Funding the IRA.

Q. What is the best investment for your IRA?

A. Although you may, in general, choose from stocks, bonds, CDs, limited partnerships - virtually any individual investment, with the exception of collectibles such as art, gold, silver or antiques - no single investment is right for every IRA investor. And the suitability of a particular investment may change as market and/or economic conditions change.

With E.F. Hutton's Self-Directed IRA, you may select a new investment every year, so that you can invest in whatever you want, whenever you want it. What's more, if you are an aggressive investor, you may even use your IRA as a trading account. (The gains and income you earn buying and selling securities would not be subject to tax while under the IRA shelter.)

Which way for your IRA? If you are interested in discussing investment opportunities for your IRA, call me (toll free @ 800/922-1112) for further information.

FURTHER INFORMATION

If you would like to receive further information on any of the topics covered in this newsletter, please write to Martin Lefkowitz, CFP, E.F. Hutton & Company, Inc. 2700 Middleburg Drive, Suite 200, Columbia, SC 29204; or Call (800) 922-1112.

* * * * * * * * * * *

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LETTERS TO THE EDITOR

MOTORCYCLE HELMET REPEAL AND FATALITIES

To The Editor:

I was struck by several errors and puzzling assertions in the recent article which attempted to link motorcycle helmet repeal with motorcycle fatalities in South Carolina.[1]

First of all, the helmet law has not been repealed. It was modified to allow freedom of choice for adults.

Secondly, the first sentence in the article is in error. Prior to 1966, nobody had done any studies on motorcycle fatalities or helmet use, so it is erroneous to conclude that the Dept. of Transportation's new powers to encourage helmet use had anything to do with any connection between helmets and safety.

Thirdly, the authors assert that from 1979 to 1984, "the registration death rate increased 221 percent and the registration accident rate increased 171 percent." These figures are incorrect. The correct numbers are 121 percent and 71 percent, according to the data contained in the article.

The authors assert that the modification of the helmet law caused an increase in motorcycle deaths, but they don't prove this at all. Moreover, they fail to note several other factors that weaken the hypothesis.

For instance, from about 1979 to 1982, the S. C. Dept. of Highways and Public Transportation sponsored motorcycle safety courses at state tech schools. Was the lower motorcycle death rate in 1981 due to this? This issue needs to be explored. Why was this safety program stopped if it was working? A scientific study should explore alternative explanations of the data.

Of the 1984 motorcycle fatalities, six were mopeds (the Highway Dept. erroneously lumps these in with motorcycle deaths), four were pedestrians, and three were bicycles. Seven fatalities were out-of-state residents. These variables should be taken into account.

Of the 92 fatalities, 30 victims were wearing helmets, and 62 were not. In order to assess the effect of helmets on safety, much more data need to be compiled on helmet usage and the relative frequency of user deaths and nonuser deaths.

The authors cite studies showing that in some states which have repealed or modified helmet laws, there was an increase in head injuries and deaths. They fail to note that Iowa experienced a dramatic decrease in the death rate when the helmet law was modified in 1976. In Washington state, which has no mandatory helmet law, there has been an increase in motorcycle registrations and a decrease in fatalities over the past several years. To be honest and complete, the authors should have included this information in their study. The citizens of South Carolina deserve to hear the full story.

Of the 92 motorcycle deaths in S. C. during 1984, 17 of the 62 who were not wearing helmets were under 21. I have also heard that over 60 percent of the fatalities in persons under 21 involve helmetless drivers. Obviously, law enforcement officials cannot enforce the current law. If they are overburdened with further requirements, they'll have less time available to enforce the really important laws against drunk driving and violent crimes.

Of course, as a libertarian, I recognize that individuals should have the right to decide how to run their own lives, as long as they don't violate the rights of other persons. Personal safety should be left to the discretion of the individual, at least for adults. I am not a motorcycle driver, but I certainly hope that the legislature fails to mandate helmet use for adult motorcyclists. Law enforcement officials should pour all their effort into protecting us from criminals and drunk drivers.

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REFERENCE

1. McHugh TP, Raymond J: Safety helmet repeal and motorcycle fatalities in South Carolina. J SC Med Assoc 81: 588-590, 1985.

To The Editor:

In reference to the recently published "study" titled "Safety Helmet Repeal and Motorcycle Fatalities In South Carolina" by T. P. McHugh and J. Raymond, I wish to point out some obvious errors and misconceptions.

Aside from the obvious mathematical errors the entire report appears to attempt to prove South Carolina Highway Department position on the current mandatory helmet law and is not an actual study of the issue. There are so many errors in data and assumptions taken as fact that I doubt that there has been any real study done. The entire report appears to be merely a statistical analysis of certain data and nothing more.

In order to actually study the effectiveness of the change in the mandatory helmet law we must study the number of accidents, the number of personal injury accidents and the number of fatal accidents. We must also study the relationship of these figures for those under the age of 21 and those over the age of 21. Registrations are not a valid reflection of motorcycle usage or exposure because of their seasonal nature. Usage is generally limited to weather conducive to enjoyment of the elements. This can be seen in the small accident and fatality figures for bad weather and the high figures for good weather.

If we study the fatal accident to total accident ratio for the years from 1967 through 1984 we find no significant statistical difference between the years of total mandatory helmet usage and those years of adult freedom of choice. You will note that the "best" year is 1981 which was the first full year of adult freedom of choice. You will also note that the "worst" year was 1983 which is also a freedom of choice year. The difference between these two years is 1.21 percent, statistically insignificant. The "best" year for total helmet use was 1971 while the "worst" year was 1968. The difference between these years is .78 percent, for a difference of .43 percent, again statistically insignificant.

A more accurate comparison would be that of the injury accidents to the total number of accidents. This would more accurately indicate the effectiveness of helmet usage. Although the Highway Department figures do not indicate helmet usage or the age of the injured parties, a simple comparison can be made.

The "best" year was 1977 while the "worst" was 1969. The "best" year for adult choice was 1984 while the "worst" was 1981. The years 1968 and 1980 are excluded because enforcement of the helmet law was only for six months during these two years. You'll note that there has been a steady decrease in the injury to accident ratio since the helmet law change in 1980. Actually there has been a gradual decrease in this ratio since the helmet law was first enacted until 1975 with a gradual increase starting in 1976.

It is interesting to note that while 1981 had the "best" fatality to accident ratio of all the years since 1967 it was the "worst" adult choice year for injury accidents to total accidents. This would indicate that, on the surface, the use of a helmet does not significantly impact the ratio of fatalities or injuries to the actual number of accidents.

It is also important to note that over 27 percent of those reported killed in 1984 without helmets were under the age of 21 in violation of the current helmet law. This represents over 60 percent of those killed in motorcycle accidents under age 21. This would point to the lack of enforcement of current law by law enforcement agencies and the misconception by the public that the helmet law was "repealed."

The study purposely chose selected states to make its comparisons. A more accurate measure would be to study the figures of all the states. It is very simple to pick states with figures that appear to support a given theory. There are states with no helmet law whatsoever with better accident and injury figures than South Carolina. It is also important to note that the age of choice on helmet usage in South Carolina is the highest in the nation. Every other state has either a lower age or no age limitation.

Another obvious error in the "study" is the total lack of any other variables other than the change in the helmet law. Many variables such as speed, intoxication, road conditions, equipment failure and lack of a driver's license can dramatically alter any conclusions as to accidents and fatalities. According to the Official South Carolina Accident Report the major contributing factor in fatal motorcycle accidents is "speed too fast." These are just a few examples of the many variables that affect accidents and fatalities and were not addressed in this "study."

Using the registration ratios that the study uses we find that the death rate per 100 registrations for 1984 is slightly greater than that of 1972, the "worst" years for choice and no choice. We find

that the difference is .00075 or .075 percent, statistically insignificant. The study chose to use the 10,000 registration figure for the death rate simply because the figures are so low using the 100 registration base.

In conclusion let me state that this "study" and its conclusions place serious doubt on the credibility and integrity of *the Journal of the South Carolina Medical Association*. It also places real doubts as to whether the authors actually made a serious attempt to study the issue or simply chose to copy the figures and conclusions of Mr. Talmadge Legrand, Director, Highway Safety Division, South Carolina Dept. of Highways and Public Trans.

For further information on the issue of helmet laws and their effect on accidents and fatalities I suggest that you contact the Motorcycling Doctors Association. They are against mandatory helmet laws although they fully support and encourage the use of helmets as does every major motorcycling organization including ABATE of South Carolina.

In the future it would be advisable for *The Journal* to read over and edit "studies" submitted for publication. It shows a definite lack of professional integrity to publish such an obviously biased and prejudicial "study."

Jesse D. McDugald
State Co-ordinator
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Table

Injury Accident/Total Accident:

1967:67.12%	1968:72.50%	1969:73.16%	1970:59.80%
1971:58.21%	1972:59.95%	1973:55.92%	1974:55.37%
1975:54.99%	1976:55.64%	1977:54.05%	1978:56.82%
1979:60.27%	1980:59.96%	1981:59.57%	1982:59.09%
1983:56.62%	1984:56.50%		

° The S. C. Highway Dept. does not include fatal accidents in the injury accident figures. For the purposes of these calculations they are included as it is felt that a fatality is a major injury.

Fatal Accident/Total Accident:

1967:2.45%	1968:3.21%	1969:2.94%	1970:2.47%
1971:2.43%	1972:3.03%	1973:2.50%	1974:2.54%
1975:2.67%	1976:2.56%	1977:2.89%	1978:2.43%
1979:2.59%	1980:3.06%	1981:2.33%	1982:2.87%
1983:3.54%	1984:3.43%		

The above letters were referred to Drs. McHugh and Raymond, whose response follows.

IN RESPONSE:

We would like to thank Dr. Morris for calling attention to our error in reporting the percentage increase in registration death rates and accident rates. We take responsibility in not more carefully reviewing the final draft of our paper to correct this mistake and apologize for any confusion this may have created.

In response to his assertion that the government acted capriously and there were no studies of motorcycle fatalities or helmet usage prior to 1966, we have included a few references he may care to review.[1-3] Early research on motorcycle accidents and head injuries was carried out even before World War II.[4]

We would not like to engage in a semantic argument with either writer over whether exempting everyone over 21 years of age from mandatory helmet usage is a repeal or a modification of law. The reader can draw his own conclusions.

Although statistics were obtained from the South Carolina Department of Highways and Transportation, we can assure the readers that no one from that department saw or had editorial approval of our manuscript before publication. Likewise, no attempt was made to selectively screen data from different states. What we obtained is readily available from any search of the literature.

We certainly do not agree with Mr. McDugald's statement that motorcycle registration is not valid reflection of motorcycle usage and, in all honesty, we could not logically follow Mr. McDugald's "best year" — "worst year" discussion. In response to Mr. McDugald's assertions that we did not look into other possible variables, this had already been done. Although we doubt there is any amount of evidence that would change Mr. McDugald's opinions, we refer him to the study *Motorcycle Associated Mortality: South Carolina* available from the S. C. Department of Health and Environment Control (Drs. Maloney and Parker) in which all single motorcycle accidents occurring in 1983 were examined. They looked at 14 variable factors, including all the factors he and Dr. Morris mention, and found that only riders who hit a fixed object or were not wearing a helmet were significantly more likely to be killed in a motorcycle crash. Personal param-

eters (age, race, sex), prevailing conditions (day/month, weather conditions, road variables, location), and moving violations (speeding, DWI) were not associated with a risk of death at the $p \leq 0.05$. They also found that among hospitalized patients, severe head injuries, including skull fractures, were more significantly associated with the unhelmeted riders. The same findings have been found in other studies.[5] The purpose of our paper was not to repeat the same study but to bring before South Carolina's medical community the disturbing fact that since repeal of mandatory safety helmet usage fatal motorcycle accidents have more than doubled (42 in deaths 1979 and 92 deaths in 1984). Hopefully, informed physicians would stress the importance of safety helmet usage to any of their patients who ride motorcycles.

In closing, we would like to quote Dr. Norman McSwain's editorial response on the same subject: "It would seem as if the American Motorcycle Association has begun to realize that because of their activism in getting motorcycle helmet laws repealed and in the subsequent and easily predictable increase in fatality rates, head injury rates and accident rates, that they are beginning to feel guilty about it and are now trying to shift the blame to the medical community. Let the blame lie where it should, on those who initiated the repeal of the laws."[6]

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ON THE COVER: JOSIAH CLARK NOTT, M.D., 1804-1873

An "Animalcular origin" for yellow fever was a unique concept first promoted by Josiah Clark Nott, M.D., in his 1848 contribution to the *New Orleans Medical and Surgical Journal*. Believing that many diseases were caused by various vectors, Dr. Nott brought attention to himself in 1844 by describing the condition called coccygodynia. Dr. Nott had some conclusions on the hypothesis of insect life as a cause of disease through observations of his own and those of Sir Henry Holland. Nott believed that "it is probable that yellow fever is caused by an insect or animalculae bred on the ground, and in what manner it makes its impression on the system is but surmise."

Josiah Clark Nott, M.D., was a South Carolinian born in Columbia. His undergraduate career began with an A.B. degree from the South Carolina College in 1824 and subsequent study under the tutelage of Dr. James Davis of Columbia and at the College of Physicians and Surgeons in New York. He graduated from the University of Pennsylvania in 1827 and began his practice of medicine in Columbia. He furthered his studies in 1835 by spending a year in Europe and upon returning to America, established his practice in Mobile, Alabama. He later moved to the University of Louisiana and held the Chair of Anatomy while founding the Medical School in Mobile. The Confederate War disrupted Dr. Nott's work and, following a time of service on the medical staff of General Braxton Bragg, he resumed his career at the close of the War in Baltimore and later in New York as a Gynecologist.

Yellow fever was, of course, a disease that played a major role in the history of South Carolina. Charleston was the most severely involved of our cities and its coastal location allowed for importation of the disease. Charleston suffered from sieges of yellow fever in 1862, 1864, and 1865. One of the early epidemics was first reported by Dr. Robert Lebby, (who has been outlined in this series) who was Charleston's quarantine officer. He discovered yellow fever on ships bound for Charleston when they crossed the Georgia-South Carolina line in 1871. During this particular epidemic, the Medical Society advised the city dwellers of the epidemic potential, but unfortunately their only recommendation was evacuation. The

Editor of *The Courier*, the local Charleston newspaper at that time, implied that the epidemic was of local cause and originated from open drains. At that time a new theory was also advanced that the disease was due to an absence of the purification which thunderstorms created with their beneficial release of ozone. Yellow fever was also in Charleston during the years of 1872, 1873, and again in 1874 and caused 40 deaths during that time. It is of interest that in 1897 the Medical Society was sufficiently concerned regarding yellow fever to send one of its members, Dr. B. R. Baker, to gain newer knowledge of the cause and treatment of the disease during a brief period in New Orleans.

Josiah Clark Nott, M.D., has the distinction of having translated Goupils' *Exposition of the New Medical Doctrine*, published in Columbia in 1831, which is a cherished translation in the archives in Columbia. There is a copy also in the Waring Historical Library.

— Thomas M. Leland, M.D., Ph.D.

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We regret that space considerations limit our ability to publish longer articles, and request that authors adhere to the above guidelines. Similarly, tables and illustrations (see below), should be kept to a minimum, and be specific and pertinent.

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Through a gift by the Roe Foundation, a Thomas A. Roe and Shirley W. Roe award of $3,000 will be given each year at the annual meeting beginning in 1985. All manuscripts submitted by South Carolina physicians will be considered for the award. The award will be made, on alternate years, to a practicing physician or to an institution-based physician, and will be based on articles published in *The Journal* during the two previous years.

Articles written by practicing physicians will be judged by members of the Editorial Board of *The Journal* on the basis of original scientific content and clarity of presentation. Practicing physicians are encouraged to report observations in *The Journal*, which was originally established for this purpose.

Articles written by institution-based physicians will be judged by outside referees, to be selected by the Editorial Board. The current editorial policy of *The Journal* is that original scientific observations made by physicians such as medical school faculty members should, ordinarily, be submitted to peer-reviewed specialty-journals rather than to the state medical journal. Therefore, the Thomas A. Roe and Shirley W. Roe award will be based on *review articles* by institution-based physicians. Referees will be instructed to base their selection on (1) the quality of the review article, and specifically its instructional value for a general physician readership, and (2) the significance of the author's contributions to his or her field. Institution-based physicians should submit a current curriculum vitae and reprints of articles representative of their work, as published in specialty publications.

SOUTH CAROLINA MEDICAL ASSOCIATION

AUXILIARY

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We have all said at one time or another that our government needs to cut back on federal spending. Recently, federal cutbacks have affected our medical schools, and it is now time for the medical community to pull together in order to help make available needed funding. Every contribution given to AMA-ERF is totally used in the manner for which it is designated.

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At convention, tickets will be sold for a drawing. Presently a week of lodging at Kiawah, Hilton Head Island, and Beech Mountain are on the ticket; however, we are working to secure other resort options. What a bargain! All locations will be listed on one ticket which can be purchased for only $5.00. Not many bargains like this are available — a chance for a week at a resort and a TAX DEDUCTIBLE contribution to benefit AMA-ERF.

Each year we receive letters from the Deans of the South Carolina Medical Schools stating how much they appreciate your donations, and some of the many goals they expect to achieve through the use of the funds.

If you failed to remember AMA-ERF with a contribution when you mailed in your dues, we will be happy to receive your donation at any time. If you recognized and remembered this cause, we want to thank you and encourage you to continue to make a positive impact. Remember your contributions are TAX DEDUCTIBLE and for a most worthwhile cause. May we count on you to help?

Mrs. Thomas C. Littlejohn, Jr., Newberry
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President's Page



SYMBIOSIS

Dear John:

I have always liked the word "symbiosis." To me it reflects a mutual or helpful partnership. My sojourns across the state to the various medical societies have convinced me that that's really the system under which the physicians of this state operate. It has been said that we have a "no system" health care delivery pattern. But that is not true. There are definite medical trade areas established across the years in which physicians, by mutual respect and understanding of expertise, refer their patients and use their advocacy to place the patient's needs in the proper hands for the proper care. I have said in previous letters that I sense an increased unity among physicians of South Carolina and I now believe that their symbiotic relationship has helped develop the trust and understanding among them. The increased unity is the result of this symbiosis.

I sincerely hope that the added stresses and uncertainties of the rapidly changing reimbursement system will not affect this symbiosis. It is extremely vital that we remain close to each other and remain helpful to each other. It is just as essential that we maintain the highest possible quality of care for our patients and in so doing the profession will survive these times of uncertainty.

Yes, you are correct, I was the one kicked out of Dr. Burnsthal's sophomore physiology class. It occurred near one of his discussions on respiratory control during which I had made some remarks that did not exactly suit him. Curtis Pearcy was sitting next to me and leaned over and told me a short joke. I laughed somewhat out loud and Dr. Burnsthal thought I had laughed at him. He immediately ordered me out of the class. It took me three days with several consultations with Dean Cuttino to get back in. Needless to say I changed to a back seat in the room and refrained from commenting on his discussions throughout the rest of that course.

Our annual meeting will be next month and I certainly hope that you and Sue can attend. We have an excellent scientific program and I particularly hope you attend the President's Banquet on Saturday evening.

Yours truly,

J. Gavin Appleby, M.D.

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ON THE COVER:
SOUTH CAROLINA'S FIRST WOMAN DOCTOR

The Confederate War meant much to many South Carolinians and the aftermath of that war brought many changes to the social, political and medical apparents of our state. At the height of that conflagration in 1861, Sarah Campbell Allan was born in Charleston. Miss Allan, early in her youth, determined that a medical profession was what she wanted for her life. In those days it was difficult for women to gain access into many of the professions, but this determined young woman did. The story of her quest, her education and her life is told in the essay reproduced below presented by Dr. W. C. Worthington, Jr., December 12, 1963, to the Robert Wilson Medical History Club in Charleston.

"Sarah Campbell Allan was born in Charleston, South Carolina, on December 7, 1861, and died in Charleston, South Carolina, on the 25th of February, 1954. She was the daughter of James Allan, a prominent Charleston jeweler and silversmith, and Amy Sara Hobcroft Allan. Dr. Allan's life is of interest to us because she was the first woman in South Carolina to be duly qualified and duly licensed by the South Carolina Board of Medical examiners.

Dr. Allan was not, however, the first woman to practice medicine in South Carolina. An article by Nell Flynn Gilland, in the Columbia *State* of 1937, which appears to have been subject to some fairly thorough research although I have not checked into the primary sources on this matter myself, discusses one woman in the 19th century who practiced in South Carolina before the licensure of Dr. Allan in 1894. I quote from that article:

> The early pioneer was Dr. Rhoda Waters Summers Kilgore of Greenville who read medicine under her husband, Dr. James Kilgore, whom she married at the age of 14. She practiced in Newberry County in the 1820's and the 1830's. How Dr. Kilgore met requirements to receive a state license or whether she was required to pass a State Board is uncertain.

It had been a lifelong ambition of Sarah Allan to study medicine and become a practicing physician, a matter in which she was encouraged by her father. She had reached the age of 30 before the opportunity arose to fulfill this ambition. Family tradition has it that she made application to the Medical College of South Carolina for admission into the medical class and was refused on the basis of the then prevailing attitude that the medical profession was not a suitable area for women. This rebuff rankled the Allan family and I believe is still mildly resented by Miss Amy Allan till this day. I made an attempt to document this by consulting Miss Catherine Harper, the registrar of the Medical College. She informed me that no records of applicants from that time were in existence. Having been rebuffed by the Medical School here, she decided that if she could not study medicine she still wished to be a part of the healing arts and would study nursing instead. Her father is said to have told her that if she really wanted to study medicine that is what he wanted her to do. He wanted no compromises. She then made application to the Women's Medical College of the New York Infirmary, which I might add parenthetically was subsequently incorporated into the Cornell Medical School, was accepted and received her degree from that institution in 1894. At this time she was 33 years old. She did some additional study at the Johns Hopkins University Medical School. It should be noted that she studied under Dr. Elizabeth Blackwell in New York. An article by Roy Ellis, from the Columbia *State*, which unfortunately is undated but which was written after Dr. Allan's death, points out that by an interesting coincidence Dr. Blackwell, who was the first woman physician in this country, got her early medical training in South Carolina, with Dr. Samuel H. Dickson, Professor of Physiology and Pathology at the Medical School in Charleston.

I think one could think of this as two separate threads in the history of South Carolina medicine crossing at the New York Infirmary with Dr. Allan studying with Dr. Blackwell, who was Dr. Dickson's pupil.

In 1894, Dr. Allan took the South Carolina State Board examinations in medicine and again family tradition and numerous newspaper accounts have it that of the group of examinees, Dr. Allan obtained the highest grade. Mr. N. B. Heyward, the Executive Secretary of the South Carolina State Board of Medical Examiners, has been kind enough to document this for me. The earliest

records that he has are of examinations given on October 9th and 10th, 1894. Dr. Allan was one of 14 people who took the examination, and she made the highest average (85.4) and the highest grade on any single examination (obstetrics 100%). The State Board was organized in April, 1894.

Having finished her medical training, Dr. Allan received an invitation to become resident physician at Converse College, but she had no interest in being a doctor in a girl's college and was offered a position at the South Carolina State Hospital by Dr. Babcock. Dr. Allan was appointed physician at the South Carolina Lunatic Asylum on the first of October, 1895, according to page seven of the 68th annual report of this institution. She was selected to fill the place of Dr. W. A. Kirby of St. George. He resigned in the summer of 1895 and he had been appointed to fill the place of Dr. M. B. Heyman, who resigned in the summer of 1894.

Dr. Allan resigned from her position at the State Hospital on May 1, 1907, a period of 11 years, and this is recorded in the 84th Annual Report of the South Carolina State Hospital for the Insane. I think it's rather interesting that the name of the institution had changed during Dr. Allan's tenure of post as physician at the State Hospital. I believe the current official name for the institution is the South Carolina State Hospital.

Dr. Allan resigned her post at the State Hospital and returned to Charleston to care for her father, and it has always been somewhat of a puzzle to me that a woman of her drive and intellectual capacity should be willing to endure such a long retirement. Apparently she considered her medical career officially at an end when she resigned her post at the hospital. If I have the dates calculated correctly, she was at this time 46 years old. I assume that at the age of 46 in 1907 it would have been much beyond her imagination to believe that at that time she still had 46 to live.

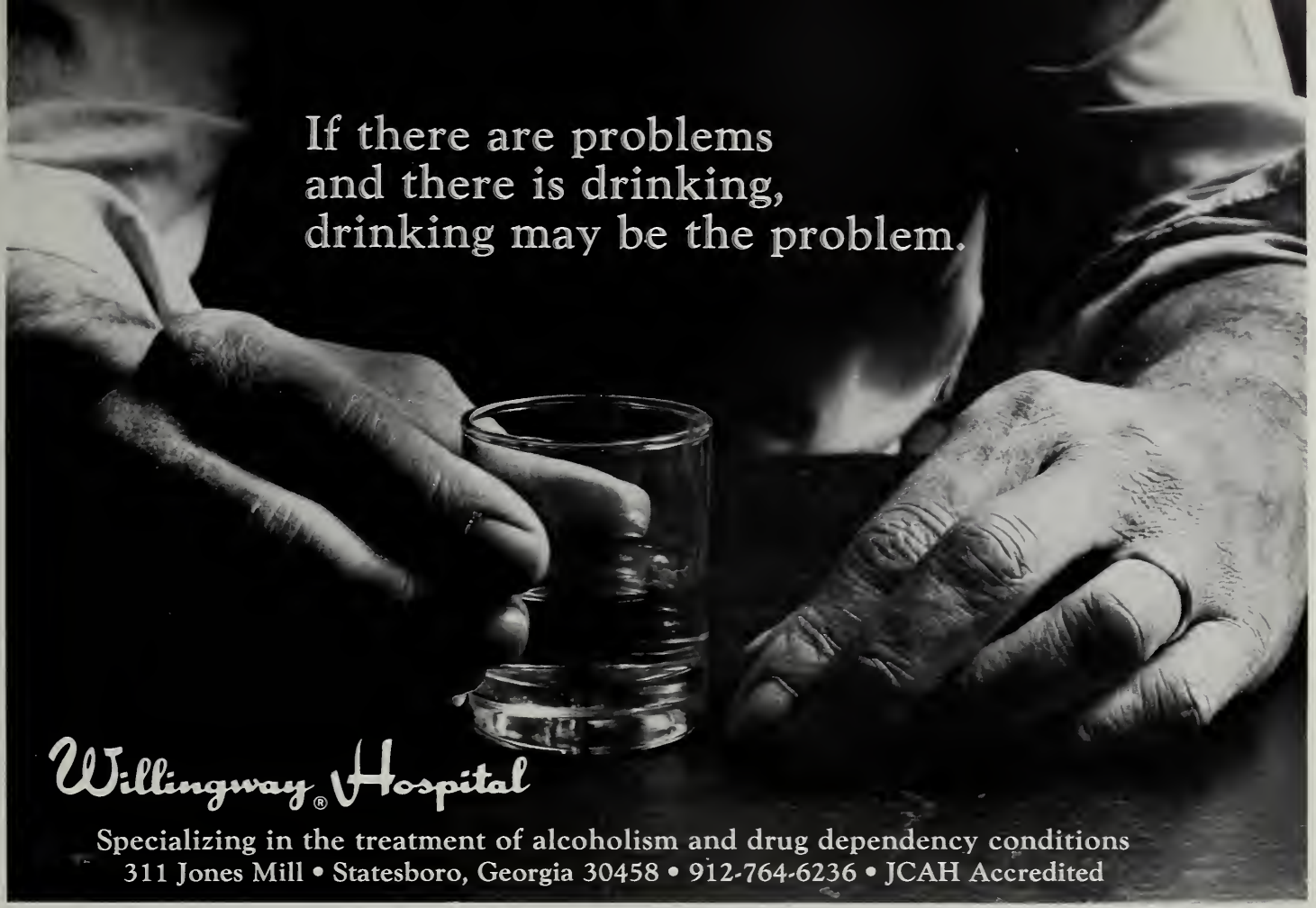
Again, family tradition indicates that she put herself at the disposal of physicians in Charleston as a consultant in psychiatry, and was of some assistance to them for at least a period of some years following her retirement from actual clinical practice.

Her continued interest in public affairs and the public welfare is a matter of record and not necessarily a part of the medical historical aspect of her career and need take little more of our time here except to note that she was an outstanding and contributing member of the community for the entire period of her lengthy retirement and retained her intellectual vigor up until a very few years before she died.

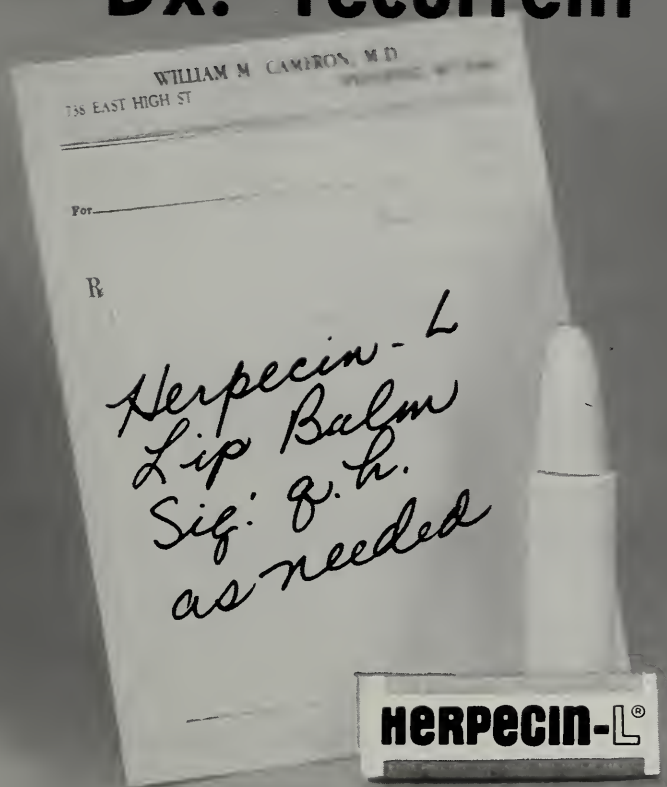
Fortunately for us, Dr. Allan was something of a keeper of diaries. She has two which are detailed accounts of travels in Europe and one which recounts some of the happenings in the South Carolina State Hospital from a period beginning on the 1st of January, 1900, until about May of the same year, when apparently the same fate befell this journal that befalls the diaries that most of us have ever tried to keep. These notes are not elaborate, but they make reference to many individuals and circumstances which tell us something of the atmosphere at the South Carolina State Hospital at the time she was there. They, for the most part, are very brief clinical notations and are in no sense a detailed critique or elaboration of conditions at the State Hospital at that time or a detailed account of what life either for Staff or for patients might have been like at that time."

The diaries to which Dr. Worthington refers in his essay have been transcripted and they are available in the Waring Medical History Library in Charleston for those interested in reviewing Dr. Allan's critiques and case histories of her tenure at the mental hospital in Columbia.

— Thomas M. Leland, M.D., Ph.D.



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COST-EFFECTIVE ANTIMICROBIAL THERAPY: AN APPROACH FOR PHYSICIANS AND COMMUNITY HOSPITALS*

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I. INTRODUCTION

Few developments in medical history have had greater impact than the introduction of penicillin. We now enjoy the fifth decade of effective antimicrobial therapy for most bacterial infections, and it is understandable that both physicians and the laity often take antibiotic therapy for granted. Textbooks, pamphlets, and monographs summarize the "drugs of choice" for various infections, making the whole subject of drug selection seem relatively straightforward. In a sense, antibiotic therapy now seems passé.

Two developments make the field of antimicrobial therapy both more exciting and more complex than ever before. The first of these developments is the availability of a truly dazzling array of new antimicrobial compounds — our gift from the research chemists. The development of new beta-lactam compounds has been mind-boggling, and may soon be surpassed by another group of agents — the quinolones. The prospect for even more effective and safer therapy has never appeared brighter.

The second development is the national mandate for cost control, forcing us to question all of our previous therapeutic dogmas. Parenteral antibiotics are usually the single most expensive item in hospital pharmacy budgets. The advent of reimbursement by prospective payment changes the pharmacy's financial posture from a revenue-generating center to a cost center, therefore changing the fiscal imperatives of administrators. And we should not forget infections in outpatients, for whom the choice of one or another agent can have a tremendous impact on family budgets. The need to employ both the new and the old antimicrobial agents with cost-conscious restraint is clear.

We sometimes cast drug companies as villains in the scenario of new drugs and rising costs. We point out that the best interests of their shareholders are served by the selling of large volumes of ever-more costly products. However, we must remember that discovery of better antibiotics has become an enterprise largely financed by the pharmaceutical firms. Due in part to tremendous expenditures needed to fulfill government regulations, each new drug represents an enormous entrepreneurial risk. Our society holds risk-taking as a virtue; without it, there could be no progress.

A number of symposium issues have been devoted to the subject of cost-effective antimicrobial therapy in prestigious journals such as *The American Journal of Medicine* and *The Reviews of Infectious Diseases*. The reader might ask, then, why should yet another issue be given to this subject in a state medical journal such as ours? Our answer is this: we felt the need for a fresh, impartial overview for practicing physicians.

Symposium issues of national journals often adhere to the following scenario. After years of intense investigation involving millions of dollars, a pharmaceutical manufacturer prepares to launch its product. The promotional campaign plans include a symposium to be edited by one or another prominent investigator. The symposium takes place at an exotic resort, where other investigators and physicians are entertained lavishly. Papers presented to this selected audience are then published as a "supplement issue." Although a prestigious journal lends its name to the endeavor, the usual refereeing process may be bypassed. The issue concludes with laudatory remarks by the physician-editor, who might well edit another symposium for a different pharmaceutical company in the near future.

The primary intent of the issue — to promote one product — may be hidden by an alleged focus on one or another scientific problem. Although occasional criticisms of these endeavors have surfaced,[1] it appears that this sometimes-uneasy liaison between academic medicine and the pharmaceutical industry is here to stay.[2]

We informed 15 major pharmaceutical firms of our intent to produce an unbiased overview of the subject of cost-effective antimicrobial therapy. We asked each firm to provide a relatively modest grant to enable us to produce an expanded issue of *The Journal of the South Carolina Medical Association*. Six companies offered full support: Glaxo, Inc., Miles Pharmaceuticals, Pfizer Laboratories, Roche Laboratories (Hoffmann-LaRoche, Inc.), Smith Kline & French Laboratories, and E. R. Squibb & Sons, Inc. Support was also received from Hoechst-Roussel Pharmaceuticals, Inc., and from The Upjohn Company. We thank these firms for their generosity that made this issue possible.

Recognizing that many readers will not have the time to peruse this issue from cover to cover, we organized the discussion according to topics of interest which can be found in the index.

The issue begins with an overview of what we

regard as the principles of cost-effective therapy: determinants of cost and relevant clinical pharmacology. Determining actual cost can be surprisingly frustrating and elusive in many instances. We propose a method by which physicians can make their own estimates of cost-effectiveness based upon current costs, pharmacology, and in vitro susceptibility data. Next, we review the currently-available and soon-to-be-marketed antimicrobial agents, attempting to place in perspective the agents within each class. Then, we review the majority of indications for antimicrobial therapy in three areas: preventive (or prophylactic) therapy; presumptive (or empiric) therapy; and precise therapy (based on the results of culture and sensitivity tests). Finally, we propose some general guidelines for use by community hospitals.

Recognizing that each of us brings to any project his or her biases, we sought impartiality in the following way. First, we reviewed the current literature, seeking the most up-to-date references for each topic, and drafted the text based on what we considered to be a reasonable consensus. Each of the co-authors was then invited to criticize the initial draft and to indicate areas of disagreement. When we reached no consensus, we made this clear. Second, we independently obtained data regarding drug acquisition costs, clinical pharmacology, and susceptibilities. From these data, we determined an index of "how much drug for the money" one buys in various situations. Cost considerations are not static but rather are dynamic and changing. Our main goal is not to emphasize our personal preferences, but rather to outline principles by which physicians and community hospitals can reach their own conclusions.

We make several disclaimers. First, dosages should be verified by consulting prescribing information sources such as the *Physicians' Desk Reference*. Second, we have not addressed pediatric therapy, which tends to be better standardized than does therapy for adults. Third, we restrict these comments to antibacterial therapy. Ten years hence, there may well be a need to review cost-effective antiviral therapy. Finally, we recognize that readers will often be more knowledgeable than the authors about some of the stopping points along the broad waterfront covered in this issue. We beg their indulgence and welcome comments.

II. DETERMINANTS OF THE COST OF ANTIMICROBIAL THERAPY

Determining the cost of antimicrobial therapy should be a simple matter. However, even superficial probing of this subject reveals numerous complexities. The true cost of this or that agent cannot be determined by simply inquiring about its price. Some major determinants of cost are shown in Table 1. We shall review each of these areas in turn.

TABLE 1. PRINCIPAL DETERMINANTS OF THE COST OF ANTIMICROBIAL THERAPY

I.	Acquisition costs
II.	Administration costs
III.	Monitoring costs
IV.	Cost of consequences

A. ACQUISITION COST

Determining acquisition cost (to a hospital or retail pharmacy) seems simple in theory but may be quite difficult in practice. Acquisition cost is often equated with a drug's average wholesale price (AWP). Average wholesale prices provide a convenient method for cost comparisons. Although we rely heavily on quoted AWPs throughout this issue, we must emphasize that in practice AWP values tend to be mythical.

Hospitals (and retail pharmacies) generally purchase drugs from one or more wholesalers. Competitive bidding and pricing is common. A pharmacy's acquisition cost is usually below the AWP value.[3] Price also reflects other marketplace realities, such as the quantity of the drug purchased.

It would seem reasonable for physicians to request information about true acquisition costs. However, pharmacies may be reluctant to disclose this information for valid reasons. They give as a major reason the need to protect competitive bidding prices. Another reason is the need to consider such difficult-to-predict factors as the cost of maintaining an inventory and the loss of revenue from expired agents.

Acquisition costs can be reduced by maintaining a closed formulary — that is, limiting drugs that can be used to agents carefully selected by the hospital's pharmacy and therapeutics committee. These agents can often be purchased in bulk at a large discount.

Generic substitutions frequently offer great reductions in cost. However, the pharmacist must be careful to insure that generic products are truly bioequivalent to brand name products. Many physicians feel more comfortable when the product is known to be made by two or more major pharmaceutical firms (e.g., a prescription for cefazolin will be filled with either Ancef or Kefzol). Most physicians feel less comfortable about permitting therapeutic equivalency substitutions — that is, permitting the pharmacy to substitute an order with an agent which, although not chemically identical, has a similar mechanism of action and track record (e.g., substituting cefazolin or cephapirin for cephalothin). We predict that the era of reimbursement by prospective payment will increasingly necessitate the use of therapeutic equivalency as well as of generic substitutions.

The closed formulary concept has been employed primarily at teaching and federal hospitals. Many published studies emanate from teaching Veterans Administration hospitals. In these settings, physicians often have less voice in matters concerning purchase of drugs owing to the more restricted economic environment. However, as third party payers increasingly turn to such models for cost containment, community hospitals may find to their advantage the maintenance of closed formularies and allowance for both generic and therapeutic equivalency substitutions.

In this issue, we focus on cost as paid by the hospital or pharmacy rather than cost as paid by the patient. Mark-ups in antibiotics, as in other items, vary widely. For instance, McCue determined that patient charges for cefazolin at a small, for-profit hospital in a southwestern state were six and a half times as great as those at a large, nonprofit hospital in Tennessee.[4, 5] Traditionally, these mark-ups have reflected both the hospital's economic posture and the hospital administration's attitude toward its pharmacy as a revenue-generating center needed to counterbalance various money-losing activities.

B. ADMINISTRATION COSTS

The cost of administering an antimicrobial agent may actually surpass the cost of acquisition. This is particularly true with intravenous therapy.

Over the years, there has been a palpable trend away from oral and intramuscular drug administration and towards intravenous therapy in American medical practice. The scientific basis for this trend is unclear.

Certainly, some patients have impairment of gastrointestinal absorption while others are too ill to receive medication by mouth. Nevertheless, as we shall examine later in this issue, certain drugs can be given orally to most patients with anticipation of extremely favorable pharmacokinetics. Patients unable to swallow tablets or capsules can often be given liquid (pediatric) suspensions. These preparations permit oral therapy for patients with nasogastric feeding tubes. Recently, interest has focused upon the use of rectal suppositories for administration of certain agents such as metronidazole (Flagyl). Thus, even a "strict NPO" order does not completely exclude enteral administration of antibiotics.

For whatever reason, intramuscular therapy seems unfashionable. To be sure, there are certain patients (such as diabetics) in whom intramuscular absorption may be erratic. A recent study of hospitalized patients in Boston revealed local complications in only 48 of 12,134 patients (0.4 percent).[6] Nevertheless, administration of intramuscular antibiotics becomes impractical when the setting calls for frequent large doses. However, as was classically demonstrated with procaine penicillin G, the administration of a relatively small volume at long intervals (e.g., every 12 to 24 hours) is usually well-tolerated.

Intravenous therapy can be extremely expensive as well as hazardous. Pharmacy costs include supplies and labor needed for reconstitution. Nursing costs include intravenous catheters, tubing, pumps, filters, and personnel for transport and nursing administration. Tanner reported a time-motion study of the actual cost of dispensing, preparing, and administering reconstituted parenteral antibiotics. He estimated that decreasing the number of daily infusions of first and second generation cephalosporins (as might be possible with agents having long serum half-lives) might save 25 to 75 percent of the total cost.[7] The actual cost of administering each intravenous dose varies, and is often impossible to determine for a given institution. In this issue, we shall use the conservative estimate made by McCue — that each parenteral dose of an antibiotic adds $5.00 to the real cost of hospitalization (that is, the cost incurred by the hospital, as opposed to the cost reflected in patient charges).[3, 4]

There are a number of trends towards reduc-

tion of administration costs. We have already mentioned the use of rectal suppositories as an alternative route. Intramuscular therapy might be facilitated by the use of "jet guns" similar to those used for certain vaccines. Intravenous therapy can be made simpler by administration of pre-mixed bolus doses which do not require reconstitution.

Administration of agents in the home or outpatient setting is proving to be a cost-saving measure for selected patients.[8] Home administration has been made feasible by the availability of (1) premixed antibiotic preparations which are stable for 30 days when frozen at −20 degrees C;[9, 10] (2) knowledgeable and enthusiastic nurse clinicians; and (3) interested, competing commercial companies. Savings can be substantial (Table 2).

TABLE 2. HOME INTRAVENOUS THERAPY: SUMMARY OF EIGHT STUDIES*

Total number of patients	380
Average duration (days)	19.6
Average cost per day	$ 73
Average equivalent hospital cost	$ 230
Average savings per day	$ 159
Average savings per course	$ 3079

*For references, see text

The impact of home antibiotic therapy on cost in eight published studies is shown in Table 2.[11-18] A recent report of experience with 1,000 patients suggested savings of 2,700 hospital days and $8,000,000.[19] Children, like adults, can be safely treated at home.[20] When prolonged therapy is anticipated, home therapy can be facilitated by implantation of an administration device such as a Hickman catheter.[21] One of the major obstacles to home intravenous therapy has been the reluctance of some insurance carriers (particularly Medicare) to provide this form of coverage. Home intravenous therapy, like all therapeutic modalities, carries the potential for over-use and abuse. For some infections, such as chronic osteomyelitis, the availability of home intravenous therapy may tempt us to use this modality and actually increase overall treatment costs. Nevertheless, experience indicates that this form of therapy is effective, cost-saving, and well-received.

C. MONITORING COSTS

Monitoring costs are especially great with the aminoglycoside antibiotics, which necessitate regular (at least weekly) monitoring of renal function. Many physicians routinely order serum aminoglycoside levels, which cost $30 to $50 in various hospitals. In addition, the potential for irreversible ototoxicity and the prevalence of high-frequency hearing losses (especially in the elderly) make baseline and follow-up audiograms (about $15 to $50 each) highly desirable in selected patients.

The need to determine serum aminoglycoside levels frequently — or even at all — is arguable. On the one hand, it has been suggested that peak levels correlate with therapeutic efficacy while trough levels correlate especially with the risk of toxicity.[22] Moore *et al*, recently suggested that peak serum levels should be obtained one hour post-infusion within the first 24 to 48 hours of therapy, and that such levels should exceed 5 mcg/ml for gentamicin and tobramycin and 20 mcg/ml for amikacin to provide optimum therapy for patients with gram-negative bacteremia[23] and pneumonia.[24]

On the other hand, we are unaware of any clear-cut demonstration of the usefulness of aminoglycoside serum level monitoring in a clinical practice setting (as opposed to an academic research setting). Even in a teaching hospital, a large proportion of aminoglycoside serum level assays are incorrectly obtained. Obtaining a properly-timed sample for determining the peak serum level requires meticulous coordination between the nursing staff and the phlebotomy team. The physician has no way of knowing whether a "true" peak sample (most often defined as 30 minutes after completion of a 30-minute infusion) is obtained. Using the results of a poorly-timed sample can cause serious dosing errors. Observations in teaching settings indicate that the results of these costly many assays are frequently ignored or are improperly used.[25, 26] In a recent report, only 24 percent of residents actually used the results to adjust dosage regimens.[26]

It would seem reasonable to use aminoglycoside serum assays judiciously and sparingly. It amuses us that this approach has been suggested by a researcher[27] from the same institution where other authors[23, 24] endorse routine use of these tests! Use of these assays varies among the present authors. One of us prefers to give "enough" of the

agent (recognizing that drugs such as gentamicin and tobramycin are often under-dosed) and then to measure occasional trough levels (just prior to the next dose) in selected patients. Trough levels are preferred because they are technically easier to obtain and to interpret compared to peak levels. Since the serum concentration prior to the next dose (as opposed to just after a dose) is declining relatively slowly, precise timing of the sample is less crucial than is the case with peak levels. When adequacy of therapy is an issue, reliance is placed on results of the serum bactericidal test (discussed in the next section) rather than on peak serum levels. Another of us makes more liberal use of peak serum levels in seriously ill patients.

Recently, the ability of many beta-lactam agents to cause bleeding or platelet dysfunction when given in high doses has led to suggestions to measure parameters such as the bleeding time and prothrombin time. Other parameters needing monitoring with certain drugs include the white blood count, hemoglobin, and reticulocyte count (especially with chloramphenicol). The frequency with which these parameters must be measured in practice for optimum cost-effectiveness remains poorly-defined.

D. COST OF CONSEQUENCES

Also to be considered is the "cost of consequences" — that is, failure to eradicate infection and unwanted side effects and toxicity.

As one recent editorialist has pointed out, all of us want peace of mind in treating infections.[28] Both physicians and the public are accustomed to our ability to cure most infections. Why skimp? The physician is caught in a dilemma: should he prescribe the "surest" remedy, allowing for considerable overkill, or should he prescribe "just enough?" Unfortunately, our collective prescribing habits are based to a large extent by history's having given to us penicillin G as the first really effective agent. The relative lack of toxicity and low cost of penicillin G led to therapy in much larger-than-necessary doses. Our prescribing habits may reflect this heritage when we use newer, more toxic, and more expensive agents in excessive doses.

Another cost of consequences is that of unwanted side effects. Even "safe" beta-lactam agents occasionally cause devastating adverse reactions. Two patients seen recently by one of us illustrate this point: (1) a patient receiving ticarcillin developed interstitial nephritis resulting in the need for life-long dialysis; and (2) a patient receiving bacampicillin (Spectrobid) developed the Stevens-Johnson syndrome and, despite intensive care, expired. Such instances provide sober reminders that all drugs may cause unpredictable and devastating reactions. The extent to which we should base our choice of agents on reports of rare (however serious) side effects becomes a cost-effective issue with ethical overtones.

The final cost of consequences is the well-known emergence of drug resistance microorganisms. Wide usage of antibiotics in other parts of the world has led to major problems, discussed recently by Farrar.[29] Discussing current therapy of specific infections later in this issue, we shall review again and again the problems of drug resistance in our own communities and hospitals.

E. SUMMARY

Each of these four major determinants of antimicrobial therapy costs can be contained, to some extent, by appropriate control measures. In this issue, we shall review these control measures for each of the three major areas of antimicrobial use: preventive therapy, presumptive therapy, and precise therapy. First, however, we shall review specific aspects of antimicrobial therapy which impact on cost-effectiveness.

TABLE 3. SOME RELEVANT PHARMACOLOGIC TERMS

Minimum inhibitory concentration (MIC)
Minimum bactericidal concentration (MBC)
bactericidal versus bacteriostatic activity
tolerance
inoculum effect
therapeutic ratio
"intensity factor"
synergism versus antagonism versus indifference

III. RELEVANT PHARMACOLOGY

A. DEFINITIONS

Let us begin by defining some key terms (Table 3).

The *minimum inhibitory concentration (MIC)* refers to the lowest concentration of a drug

needed to inhibit growth in a test tube of a standardized inoculum of a microorganism. The two-fold dilution method used to determine MIC values, shown in Figure 1, is actually the oldest of the current methods for determining antimicrobial susceptibility. Requiring serial pipetting by hand, this method was too cumbersome for routine clinical use. Not surprisingly, it was soon replaced first by methods using impregnated filter paper discs (the Kirby-Bauer method) and then by various novel devices such as one based on light-scattering (the Pfizer Autobac method).

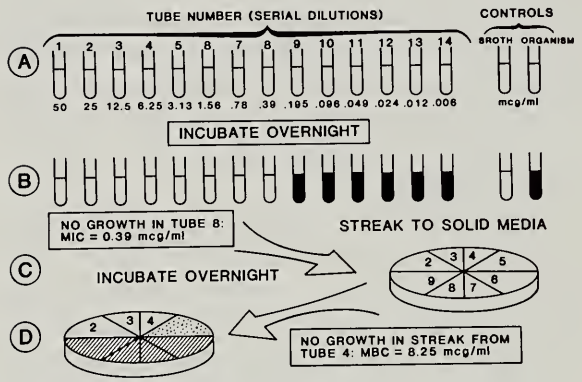


FIGURE 1. Classic two-fold dilution method for determining the minimum inhibitory (MIC) and minimum bactericidal (MBC) concentrations of an antibiotic against a standardized inoculum of a given microorganism. Note that the end-point for the MIC determination is absence of visible growth after overnight incubation (step B), whereas the end-point for the MBC determination is absence of growth on solid media after sub-culturing (step D).

Micropipetting technology and the demonstration that antibiotics are stable for prolonged periods when frozen have led to a resurrection of MIC determinations. Many laboratories in South Carolina, as elsewhere, now provide MIC data in addition to the mere reporting of whether a strain is "sensitive" or "resistant." Interpreted properly, MIC data can help us choose the most cost-effective antimicrobial agent for a given patient.

For comparing one antibiotic with another against many isolates it has become customary to use a second term — the "MIC-90." This refers to the concentration of a drug required to inhibit growth of 90 percent of strains (or clinical isolates) of a given bacterial species. It should be pointed out that if one keeps increasing the concentration of any antimicrobial agent against any bacterial species, one can eventually inhibit 100 percent of strains (if only because the organisms have no room in the medium in which to grow!). Despite some important limitations, the MIC-90 concept provides a useful focus for comparisons.

In Tables 4, 5, and 6, MIC-90 values are provided for various antimicrobial agents available for parenteral usage against common aerobic and anaerobic pathogens. We must emphasize that these values will vary among localities and among laboratories. For instance, MIC-90 values against such common pathogens as *E. coli* and *S. aureus* will tend to be much higher if strains are obtained from a major tertiary referral center, as opposed to a small private community hospital. In Tables 4, 5, and 6 we have chosen values from the literature which we consider to be representative, relying heavily upon data tabulated by various reviewers.[30-40] In some instances, values reported by different authors vary considerably, and we emphasize that our choices were sometimes quite arbitrary. While attempting to illustrate the value of such data for cost-comparisons, we emphasize that in some instances use of different data would lead to different conclusions.

The MIC reflects only inhibition of bacterial growth. Viable bacteria remaining in the medium may begin to grow when the antibiotic is removed. A second term — the *minimum bactericidal concentration (MBC)* — refers to the ability of the antimicrobial agent to destroy (rather than merely inhibit) the organisms present in the original inoculum. As shown in Figure 1, the MBC is conventionally determined by subculturing to a solid medium from the liquid medium used for the MIC determination.

One often hears the terms "*bactericidal*" and "*bacteriostatic.*" These terms are not iron-clad. The same antibiotic can at times be bactericidal and at other times bacteriostatic — depending on the microbial species being tested and on other factors. The operational definition of a bactericidal antibiotic is that the MIC and MBC values are the same or virtually the same. The operational definition of a bacteriostatic antibiotic is that the MBC is considerably greater (e.g., fourfold greater) than the MIC.

Tolerance refers to situations in which an antibiotic usually bactericidal against a given microorganism proves to be only bacteriostatic (i.e., the MBC exceeds the MIC by 32-fold or greater). An increasing number of bacterial species are "tolerant" to various antibiotics. This phenomenon may be clinically relevant especially in chronic sta-

TABLE 4. MINIMUM INHIBITORY CONCENTRATION (MIC-90) VALUES (mcg/ml) OF VARIOUS ANTIBIOTICS FOR PARENTERAL USE AGAINST COMMON GRAM-POSITIVE COCCI*

Antimicrobial agent	S. pneumoniae	S. pyogenes	S. aureus**	S. epidermidis**
Penicillin G	0.06	0.01	12.5	25
Ampicillin	0.06	0.04	12.5	3.1
Nafcillin	0.06	0.2	0.8	3.1
Methicillin	0.4	0.4	3.1	12.5
Ticarcillin	0.5	0.4	12.5	16
Mezlocillin	0.5	0.5	2	8
Azlocillin	0.5	0.5	3.1	8
Piperacillin	0.12	0.12	3.1	8
Cephalothin	0.39	0.1	0.78	1.56
Cefazolin	0.4	0.2	1.56	12.5
Cefamandole	0.25	0.25	1	12.5
Cefoxitin	2	1	4	50
Cefuroxime	0.2	0.2	8	
Cefonicid	1.6	1.6	6.3	>8
Ceforanide	1	1	4	8
Cefotaxime	0.12	0.03	2	8
Moxalactam	2	4	16	32
Cefoperazone	0.25	0.12	4	8
Ceftizoxime	0.12	0.03	2	8
Ceftriaxone	0.25	0.03	4	8
Ceftazidime	0.25	0.25	8	8
Cefsulodin	8	2	4	8
Imipenem	0.01	0.1	0.5	0.5
Aztreonam	>100	>100	>100	>100
Gentamicin	>100	>100	0.4	0.8
Tobramycin	>100	50	0.4	0.8
Amikacin	>100	>100	1.56	6.25
Netilmicin	>100	>100	0.39	25
Erythromycin	0.12	0.10	0.39	25
Clindamycin	0.10	0.05	0.20	25
Metronidazole	>100	>100	>100	>100
Chloramphenicol	3.8	12.5	12.5	1.56
Tetracycline	3.1	3.1	0.1	>100
TMP/SMX §	0.5	1.5	0.1	0.2
Vancomycin	0.39	0.39	0.78	3.12

*For definitions and also for some important limitations of these data, see text.
**In general, these data apply to non-penicillinase-producing strains.
§TMP/SMX = trimethoprim-sulfamethoxazole

phylococcal infections, such as osteomyelitis.[41, 42]

The attentive reader might intuitively suspect that MIC/MBC determinations often reflect laboratory arbitrariness rather than clinical reality. This is indeed the case. Customarily, these determinations begin by inoculating approximately 100,000 organisms (or colony forming units) into each ml. of liquid medium. In infected tissues and body fluids, the concentration of microorganisms may be much greater.

The *inoculum effect* refers to instances in which the MIC and MBC values are profoundly affected by the number of organisms in the original medium. Generally, this is determined by comparing values obtained at a conventional inoculum (10^5 micoorganisms per ml) with those obtained at a greater inoculum (10^7 microorganisms per ml). Recalling that bacteria usually reach a concentration of 10^9 microorganisms per ml in a favorable broth medium, we can readily discern that this might be of clinical importance.

B. RELATING MIC'S TO PHARMACOKINETICS

Clinically, MIC values must be related to the concentration of antibiotic delivered to the patient's fluids and tissues. We are accustomed to the term "therapeutic index," expressing the ratio of

TABLE 5. MINIMUM INHIBITORY CONCENTRATION (MIC-90) VALUES (mcg/ml) OF VARIOUS ANTIBIOTICS FOR PARENTERAL USE AGAINST SELECTED SPECIES OF ENTEROBACTERIACEAE*

Antimicrobial agent	E. coli	Klebsiella pneumoniae	Proteus mirabilis	Enterobacter aerogenes	Serratia marcescens	Citrobacter species	Salmonella species	Shigella species
Penicillin G	>100	>100	>100	>100	>100	>100	>100	>100
Ampicillin	>100	>100	>100	>100	>100	>100	>100	>100
Nafcillin	>100	>100	>100	>100	>100	>100	>100	>100
Methicillin	>100	>100	>100	>100	>100	>100	>100	>100
Ticarcillin	100	>100	3.1	>100	>100	>100	>100	3.1
Mezlocillin	>100	>100	0.5	>100	>100	>100	>100	>100
Azlocillin	>100	>100	16	>100	>100	>100	>100	>100
Piperacillin	>100	>100	1	25	>100	50	>100	50
Cephalothin	25	12.5	4	>100	>100	>100	6.25	12.5
Cefazolin	12.5	6.25	6.25	>100	>100	>100	3.1	12.5
Cefamandole	16	8	6.3	>64	>64	2	6.25	6.25
Cefoxitin	8	8	4	>64	64	64	3.1	3.1
Cefuroxime	6.2	25	50	12.5	>100	>100	6.2	50
Cefonicid	0.8	12.5	0.4	>100	>100	4		
Ceforanide	2	16	0.5	>100	>100	>100		>100
Cefotaxime	0.25	0.25	0.1	0.2	4	0.5	0.25	0.25
Moxalactam	0.25	0.25	0.2	0.2	4	0.5	0.25	0.25
Cefoperazone	16	16	1	2	16	1	1	1
Ceftizoxime	0.25	0.25	0.1	0.2	2	0.25	0.25	0.25
Ceftriaxone	0.25	0.25	0.05	0.2	4	0.5	0.25	0.25
Ceftazidime	0.5	0.25	0.2	0.2	2	0.5	0.25	0.25
Cefsulodin	>100	>100	>100	>100	>100	>100	>100	>100
Imipenem	0.25	0.25	2	0.2	1	0.1	0.1	0.1
Aztreonam	0.25	0.25	0.1	0.2	2	0.5	0.1	0.1
Gentamicin	3.5	3	3	3	4	3	0.8	1.56
Tobramycin	3.5	4	3	4	8	3	1.56	1.56
Amikacin	4	5	8	6	7	6	6.25	6.25
Netilmicin	2	2	3.5	2	6	2	0.4	1.56
Erythromycin	>100	>100	>100	>100	>100	>100	>100	>100
Clindamycin	>100	>100	>100	>100	>100	>100	>100	>100
Metronidazole	>100	>100	>100	>100	>100	>100	>100	>100
Chloramphenicol	50	>100	50	>100	>100	12.5	3.1	>100
Tetracycline	>100	>100	>100	>100	>100	>100	3.1	>100
TMP/SMX	0.5	3.1	0.5	0.5	0.5	2	0.5	0.5
Vancomycin	>100	>100	>100	>100	>100	>100	>100	>100

*For definitions and also for some important limitations of these data, see text.

the effective dose of a given drug to the toxic dose. A similar term, "*therapeutic ratio*" or "*inhibitory quotient*[43, 44] is defined as follows:

$$\text{THERAPEUTIC RATIO (inhibitory quotient)} = \frac{\text{SERUM (OR BODY FLUID OR TISSUE) CONCENTRATION (in mcg/ml)}}{\text{MIC (mcg/ml)}}$$

This parameter enables us to estimate the adequacy of antimicrobial therapy in a given patient at a given time. However, it may be an unreliable gauge for determining cost-effectiveness especially because some drugs are rapidly eliminated from the body (and may thus have a high therapeutic ratio but for only a brief duration) whereas others are more gradually eliminated. Therefore, it is necessary to introduce a second term — the "*intensity factor*" (Figure 2). This term expresses the relationship of the therapeutic ratio to the time-serum concentration curve following a dose of an antimicrobial agent. As shown in Figure 2, the major determinants of the intensity factor are the peak serum (or body fluid or tissue) concentration and the half-life of elimination.

In subsequent sections, we shall attempt to relate MIC-90 values to the intensity factors for various antimicrobial agents against various pathogens, using values for peak serum concentrations. Peak serum concentrations for various antimicrobial agents available for parenteral use are shown in Table 7. Again, we must caution that these values, although taken from a single authoritative source,[45] are somewhat arbitrary. Several additional qualifications are necessary.

First, certain antibiotics are more highly protein bound than others. Peak serum concentrations can be measured in two ways — as bound drug or as free drug. Methods for determining protein binding vary considerably.[46] To add to the complexity, free drug levels may affect the extent of protein binding. The clinical significance of protein binding is a traditional subject for debate. However, it is clear that only the free drug can be active.[47] Drusano et al. have proposed a method for determining the intensity factor both for total and free drug against different pathogens.[48] The

TABLE 6. MINIMUM INHIBITORY CONCENTRATION (MIC-90) VALUES (mcg/ml) OF VARIOUS ANTIBIOTICS FOR PARENTERAL USE AGAINST SOME MISCELLANEOUS GRAM-NEGATIVE BACTERIA*

Antimicrobial agent	Hemophilus influenzae**	Pseudomonas aeruginosa	Acinetobacter calcoaceticus	Neisseria gonorrhoeae**	Bacteroides fragilis
Penicillin G	3.1	>100	>100	0.5	32
Ampicillin	1.56	>100	>100	0.25	>100
Nafcillin	>100	>100	>100		>100
Methicillin	>100	>100	>100		>100
Ticarcillin	1	>100	64	0.5	64
Mezlocillin	0.5	>100	>100	0.2	32
Azlocillin	0.12	>100	64	2	32
Piperacillin	3.1	64	64	0.12	6
Cephalothin	12.5	>100	>100	1.56	>100
Cefazolin	25	>100	>100	3.1	>100
Cefamandole	0.5	>100	>100	4	32
Cefoxitin	4	>100	>100	4	8
Cefuroxime	0.5	>100	>100	0.5	32
Cefonicid	0.8	>100	>100	0.8	>100
Ceforanide	3.1	>100	>100	3.2	32
Cefotaxime	0.03	64	>100	0.15	>100
Moxalactam	0.06	32	>100	0.06	32
Cefoperazone	0.12	32	>100	0.06	64
Ceftizoxime	0.03	64	>100	0.015	16
Ceftriaxone	0.015	64	>100	0.01	32
Ceftazidime	0.12	8	>100	0.12	64
Cefsulodin	32	32	>100	8	
Imipenem	2	4	8	0.25	0.5
Aztreonam	0.1	8	6.25	0.1	32
Gentamicin	1.56	12.5	6.25	8	>100
Tobramycin	1.56	4	6.25		>100
Amikacin	6.25	16	6.25	12.5	>100
Netilmicin	6.25	25	12.5	8	
Erythromycin	4	>100	>100	4	5
Clindamycin	6.25	>100	>100	3.1	4
Metronidazole	>100	>100	>100	>100	2
Chloramphenicol	0.8	>100	50	5	8
Tetracycline	0.8	>100	12.5	1	32
TMP/SMX	0.25	>100	>100	1.56	
Vancomycin	>100	>100	>100	>100	>100

*For definitions and also for some important limitations of these data, see text.
**In general, these data apply to non-penicillinase-producing strains.

method is complicated, and for the sake of simplicity we shall not make these distinctions here. However, the reader should be aware of the variations in extent of protein binding shown in Table 7.

Second, peak serum concentrations can be difficult to determine in actual practice (as discussed in Section II). Values depend both on the timing of the samples and also on the assay methods used. Reported values may vary widely.

Finally, successful therapy requires delivery of adequate amounts of drug to infected body fluids and tissues. This may or may not be reflected by serum concentrations. In some instances (as in the urine for antibiotics primarily eliminated by the kidneys and in the biliary tract for antibiotics primarily eliminated by the liver), body fluid concentrations exceed peak serum concentrations by more than a hundred-fold. In other instances (as in the cerebrospinal fluid), body fluid con-

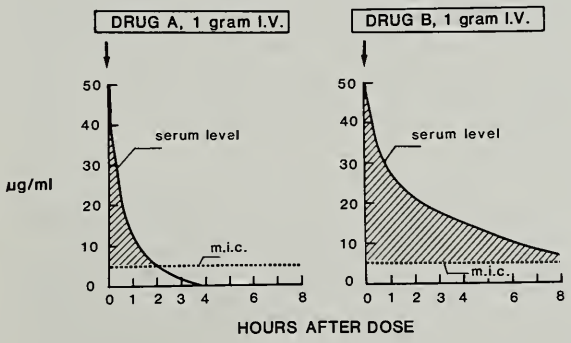


FIGURE 2. The shaded areas under each time-serum level curve indicate the "intensity factor" (extent to which the serum concentration of an antibiotic after a given dose exceeds the MIC). In this instance, drug A and drug B provide identical post-infusion serum concentrations (50 mcg/ml) and also exhibit the same MIC value (5 mcg/ml) against a hypothetical microorganism. Drug B provides a greater "intensity factor" by virtue of its slower elimination rate.

TABLE 7. SELECTED PHARMACOKINETIC PARAMETERS OF VARIOUS ANTIBIOTICS FOR PARENTERAL USE

Antimicrobial agent	Peak serum level (mcg/ml)*	CSF penetration**	Protein binding§	Serum half-life (hours) normal	Serum half-life (hours) anephric¶
Penicillin G	20 (during 24 m.u./day)	2-6%	53-56%	.5	10
Ampicillin	40 (after 1 gram IV)	8-13%	16-21%	1	6
Nafcillin	11 (after 0.5 gram IV)	9-20%	86-89%	.5	1.5
Methicillin	60 (after 1 gram IV)	3-12%	37-49%	.5	4
Ticarcillin	190 (after 3 grams IV)	9.5%	45-65%	1.2	14.8
Mezlocillin	310 (after 3 grams IV)	14%	35-59%	1	4
Azlocillin	350 (after 3 grams IV)	13%	39-66%	1	5
Piperacillin	244 (after 4 grams IV)	15.7%	21-50%	1	3
Cephalothin	90 (after 2 grams IV)	1-6%	62-79%	.8	12
Cefazolin	188 (after 1 gram IV)	1-4%	84-88%	1.9	46
Cefamandole	165 (after 2 grams IV)	.5-20%	75-82%	.7	8
Cefoxitin	117 (after 1 gram IV)	50%	67-69%	.8	21
Cefuroxime	100 (after 1 gram IV)	6-10%	30-45%	1.5	15
Cefonicid	150 (after 1 gram IV)		98%	4.4	57
Ceforanide	135 (after 1 gram IV)		81-82%	3	30
Cefotaxime	85 (after 2 grams (V)	10-25%	30-47%	1	2.7
Moxalactam	150 (after 2 grams IV)	10-20%	52-67%	2.2	19
Cefoperazone	200 (after 2 grams IV)	5-9%	87-94%	2.1	3.2
Ceftizoxime	120 (after 2 grams IV)	21-22%	28-31%	1.7	30.5
Ceftriaxone	270 (after 2 grams IV)	7-11%	83-96%	8	15
Ceftazidime	180 (after 2 grams IV)	21.5%	5-17%	1.8	20
Imipenem	73 (after 1 gram IV)		20%	1	4
Aztreonam	125 (after 1 gram IV)		27-60%	1.8	7
Gentamicin	6 (after 1.5 mg/kg IV)	10-30%	0-13%	2.3	51
Tobramycin	6 (after 1.5 mg/kg IV)	14-23%	0-10%	2	53
Amikacin	21 (after 7.5 mg/kg IM)	15-24%	0-4%	2.5	55
Netilmicin	6 (after 2 mg/kg IM)	21-26%	< 3%	2.3	33
Erythromycin	10 (after 0.5 gram IV)	7-25%	55-90%	1.4	5
Clindamycin	10 (after 600 mg IV)	minimal	79-95%	2.5	3.5
Metronidazole	27 (after 0.5 gram IV)	100%	0-20%	10	11.5
Chloramphenicol	8 (after 1 gram IV)	90%	44-63%	2.5	3.5
Tetracycline	8 (after 0.5 gram IV)	25%	32-70%	8.5	83
Trimethoprim	3.4 (after 160 mg IV)	30-50%	35-70%	11.5	23
Sulfamethoxazole	47 (after 800 mg IV)	25-30%	60-75%	10	15
Vancomycin	35 (after 0.5 gram IV	7-21%	10-55%	6	200

*Serum concentration in mcg/ml after the dose shown (by continuous infusion for penicillin, bolus infusion for all others).
**CSF concentration as percentage of serum concentration in the presence of inflammed meninges
§Ranges often indicate different methodologies for determining the percentage of serum protein binding
¶Half-lives in persons with normal renal function and persons with creatinine clearance less than 10 ml/min

centrations may be but a tiny fraction (one percent or less) of the peak serum concentrations. Thus, on the one hand reliance on serum concentrations leads to over-estimation of the necessary dose (thereby reducing cost-effectiveness), while on the other hand reliance on serum concentrations leads to under-estimation of the necessary dose.

C. UNDERTREATMENT VERSUS OVERKILL — "HOW MUCH IS ENOUGH?"

Since patients with bacterial infections are typically acutely ill, and since these infections are nearly always treatable, we face the temptation to give larger-than-necessary doses of antibiotics. That we often yield to this temptation is understandable. It can truthfully be said that there are no infections in which the "just-right" dose of antibiotics (or, to use the terminology introduced above, the magnitude of the intensity factor) is well-defined.

Bacterial endocarditis provides the best-studied example of attempts to define the extent of necessary therapy. When penicillin was scarce, several trials (predominantly carried out in Great Britain) attempted to define "how much is enough." In this country, Schlicter introduced a test which bears his eponym but which is better-termed the *serum bactericidal test* (Figure 3).[49]

As shown in Figure 3, the serum bactericidal test measures the ability of serial two-fold dilutions of a patient's serum to sterilize an inoculum of his or her own infecting microorganism. Although historically mainly carried out in academic medical centers, this test is now often available in community hospitals as well. Adaptations may make the test even more readily available in the forseeable future.[50]

Note that the method for carrying out the Schlicter test (Figure 3) differs from the method for determining the minimum bactericidal concentration (Figure 1) in only one respect: one begins by making serial dilutions of the patient's serum (containing an unknown quantity of antibi-

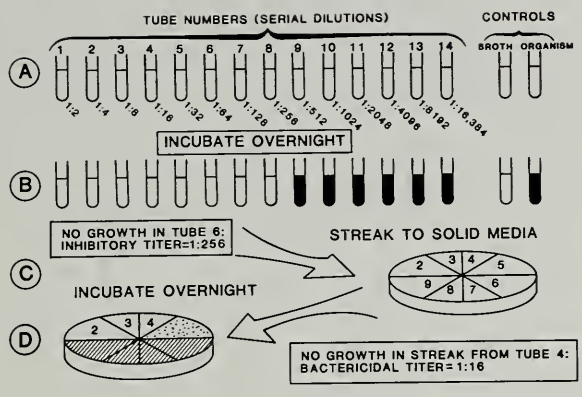


FIGURE 3. The serum bactericidal titer (Schlicter test) measures the ability of serial two-fold dilutions of a patient's serum to sterilize a standardized inoculum of his or her infecting microorganism. Note the similarity of this test to the classic two-fold dilution method for determining MIC and MBC values shown in Figure 1 (see text).

otic) rather than by making serial dilutions of broth (containing a known quantity of antibiotic). From this similarity, one could anticipate that the Schlicter test result (expressed as a serum bactericidal titer) might be predicted with reasonable accuracy if one knows both the serum antibiotic concentration and the minimum bactericidal concentration (MBC). A carefully-done study confirms this to be the case.[51]

Although the serum bactericidal test continues to be used, especially in difficult cases of endocarditis,[52] its standardization and interpretation have never been entirely satisfactory. Schlicter, apparently feeling that adequate serum concentrations of antibiotics should be present at all times during treatment, insisted on an adequate trough titer (i.e., a titer on a specimen obtained just prior to the next dose) as a guide to therapy. Most recent investigators have chosen to rely on peak titers (taken 30 to 60 minutes after an intravenous dose or 60 minutes after an intramuscular or oral dose). The test is usually carried out on or after the third day of a given regimen in order to allow the patient to reach a steady-state equilibrium.

Weinstein et al. reported a multicenter study of endocarditis in which serum bactericidal titers were done with a newly-devised microtiter system.[53] They found that peak titers of 1:64 or greater or trough titers of 1:8 or greater could be correlated with successful outcome. These values are considerably higher than those suggested by previous investigators. They also found that the serum bactericidal titer was a poor measure of therapeutic failure. A criticism of their study was that there were only nine bacteriologic failures in the entire group of 129 patients.

We do not advocate wide use of the serum bactericidal test. Like serum antibiotic level assays (Section II), great care is needed in collecting blood samples. Errors in either the timing of drug administration or venipuncture could cause misleading results. Clinicians should also realize that the test is fraught with laboratory subtleties. These include such matters as whether to make the dilutions in serum or in broth (broth dilutions of highly-protein bound drugs can give misleadingly reassuring results), and whether to control divalent cation concentrations (which have great effect on the activity of aminoglycoside antibiotics). Conceivably, current efforts to make the test both better standardized and less labor-intensive may lead to its wider acceptance.

Our major reason for discussing this rather esoteric subject is that it reflects the practical interpretation of the intensity factor. For a given patient, how much antibiotic should we administer? For most patients, this issue can be settled by considering only two variables: the severity of the infection and the condition of the host.

We know of only four bacterial infections in which it has been well-established that it is essential to kill bacteria in order to achieve cure: endocarditis, meningitis, infections in granulocytopenic patients, and infections in patients with certain primary disorders of polymorphonuclear leukocytes (such as chronic granulomatous disease of childhood). The common denominator of these infections is that the patient's phagocytes function poorly (white cell access to bacteria is limited in endocarditis; help from opsonizing antibodies is lacking in meningitis; white cell numbers are deficient in granulocytopenia; and white cells malfunction in the primary leukocyte disorders).

For most patients, all that appears to be necessary is inhibition of bacterial growth. Host defenses do the rest. Indeed, a large and growing body of literature now indicates that even inhibition is not always necessary. Even subinhibitory concentrations of antibiotics may sufficiently alter bacteria to enable leukocytes to ingest and kill them.[54]

These findings were anticipated by observations made during the 1940's by Dr. Harry Eagle and colleagues, and provided the experimental basis for intermittent penicillin therapy of common infections due to gram-positive cocci.[55] We have now learned that the subinhibitory effect is more pronounced against gram-positive bacteria than against gram-negative bacteria.[57] Therefore, continuous infusion or frequent intermittent infusion may be especially advantageous for gram-negative infections in immunocompromised patients.[58, 59] For such patients, continuous infusion therapy may actually be more cost-effective due to the high administration costs of frequent intravenous doses (see Sections II and IV).

There are a number of circumstances other than the four mentioned above in which physicians often feel the need to err towards overkill. These include pneumonia in patients with cancer and infections related to prosthetic implants. In such situations, it is often justifiable to aim for a high intensity factor and to monitor therapy with the serum bactericidal test. More commonly, clinicians are tempted to use more than one antibiotic — a subject that brings up the issue of synergism versus antagonism.

C. SYNERGISM AND ANTAGONISM

The terms "synergism" and "antagonism" — like "bactericidal" and "bacteriostatic" — are operational definitions based on in vitro studies. In one method, the MIC (and/or MBC) is simultaneously determined for two antibiotics both separately and also in combination (Figure 4). Synergism is usually defined by the presence of at least one point on the resulting isobologram in which growth is inhibited by concentrations of the antibiotic combination at least four-fold lower than when either drug is used alone. In another method, the actual concentration of bacteria is determined for several hours after inoculation of broth containing either or both antibiotics (Figure 5). Synergism is then defined by a more pronounced slope of the killing curve when the agents are used in combination, compared to separately. In both test systems, antagonism denotes a less favorable effect on bacterial growth by the drugs in combination compared to the effect of at least one of the drugs alone.

Four studies, two of which were prospective and randomized, indicate that synergistic combinations of antibiotics (as opposed to non-syn-

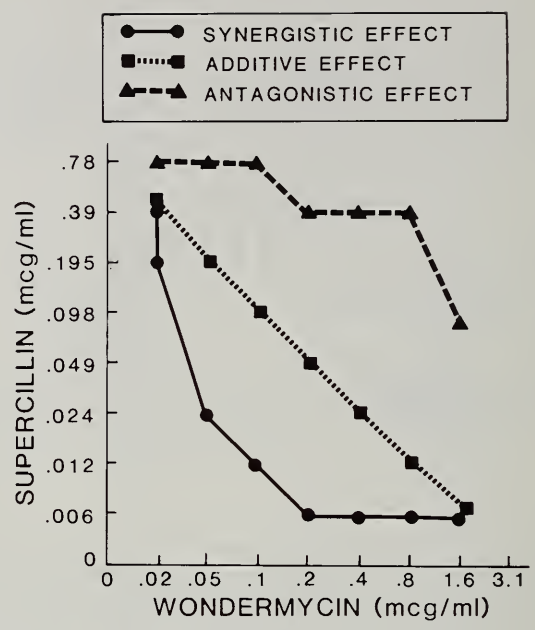


FIGURE 4. In one method for determining the interaction of two antibiotics against a given microorganism, MIC values for the drugs alone and in combination are determined by a two-fold dilution checkerboard system (patterned after the method shown in Figure 1). In this example, MIC values are 0.78 mcg/ml for supercillin and 3.1 mcg/ml for wondermycin. Note that the interaction between the two antibiotics can be synergistic, merely additive, or even antagonistic.

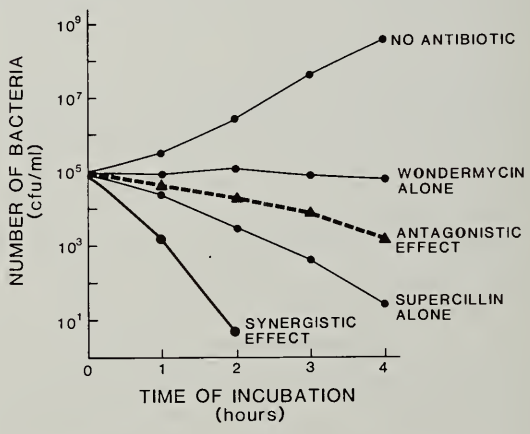


FIGURE 5. In another method for determining the interaction of two antibiotics against a given microorganism, the number of microorganisms present in a broth medium is determined at timed intervals (as opposed to a single determination after overnight incubation). In this example, supercillin alone reduces the bacterial population, whereas wondermycin alone does not. Synergism is defined by greater activity with the drugs in combination than with either drug alone. Antagonism is defined by lesser activity with the drugs in combination than with either of the drugs (in this instance, supercillin) used alone.

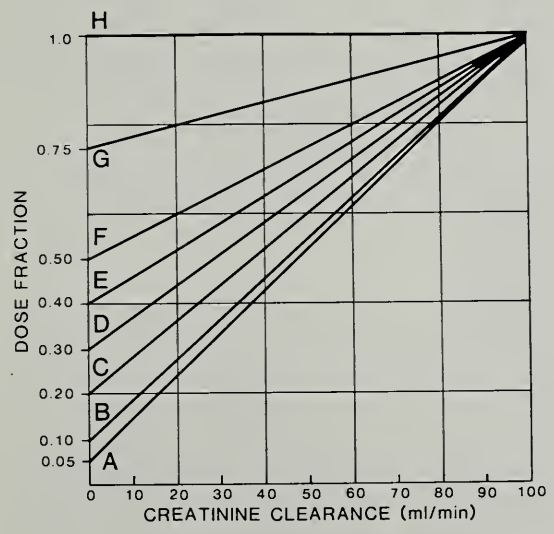
ergistic combinations of antibiotics) improve the outcome of serious gram-negative rod infections in cancer patients. This observation illustrates the desirability of employing such therapy in compromised hosts with serious, well-defined infections. For most patients synergistic combinations of antibiotics is not necessary.[60-62]

E. SPECIAL CONSIDERATIONS IN SELECTED PATIENTS

This section would not be complete without attention to several host factors which impact upon pharmacologic dosing of antibiotics.

1. Patients with Impaired Renal Function

The only advantage of renal failure, to our knowledge, is that the slower elimination rate of many drugs enables lower, cost-saving dosages to be used. Some consideration of renal function is important not only to lower costs, but also to minimize the risk of unwarranted side effects from excessive blood and tissue concentrations. Elderly patients may also need lower dosages, largely for the same reason. The glomerular filtration rate naturally declines with age, explaining the need to take age into account in making estimates of creatinine clearance (as in the equation contained in Table 8).



A large literature relates to antimicrobial dosing in renal failure and innumerable nomograms have been published for different drugs. No nomogram is perfect in the sense that serum concentrations must still be determined as a guide to therapy with any of them. One approach is to use a single nomogram for all antibiotics obeying first-order elimination kinetics (Tables 8 and 9 and Figure 6).[63] This nomogram enables calculation of the daily dose for any antibiotic if one knows the serum half-life in normal subjects and in anephric subjects receiving hemodialysis. The latter information is usually obtained early in the course of study of new investigational antibiotics.

TABLE 9. DOSING LINES FOR VARIOUS ANTIBIOTICS FOR USE IN PATIENTS WITH IMPAIRED RENAL FUNCTION (TO BE USED WITH FIGURE 6 AND TABLE 8)

Amikacin --- A	Cephalothin --- A	Nafcillin --- D
Ampicillin --- B	Cephapirin --- C	Netilmicin --- A
Azlocillin --- C	Cephradine --- A	Nitrofurantoin --- D
Aztreonam --- D	Chloramphenicol --- G	Oxacillin --- F
Bacampicillin --- B	Cinoxacin --- D	Oxytetracycline --- C
Carbenicillin --- B	Clindamycin --- G	Penicillin G --- B
Cefaclor --- D	Cloxacillin --- F	Piperacillin --- D
Cefadroxil --- B	Colistimethate --- B	Polymyxin B --- B
Cefamandole --- B	Cyclacillin --- B	Rifampin --- H
Cefazolin --- A	Dicloxacillin --- D	Spectinomycin --- B
Cefonocid --- B	Doxycycline --- H	Streptomycin --- A
Ceforanide --- B	Erythromycin --- D	Sulfamethoxazole --- G
Cefoperazone --- G	Gentamicin --- A	Tetracycline --- B
Cefotaxime --- E	Imipenem --- D	Ticarcillin --- B
Cefoxitin --- A	Kanamycin --- A	Tobramycin --- A
Ceftazidime --- B	Lincomycin --- E	Trimethoprim --- F
Ceftizoxime --- A	Methicillin --- B	Trimethoprim-sulfa-methoxazole --- F
Ceftriaxone --- F	Metronidazole --- H	Vancomycin --- A
Cefuroxime --- B	Mezlocillin --- D	
Cephalexin --- A	Moxalactam --- B	

TABLE 8. A METHOD FOR REDUCING THE DOSE OF ANTIMICROBIAL AGENTS IN PATIENTS WITH IMPAIRED RENAL FUNCTION

1. Determine creatinine clearance either by measurement or by estimation. Estimates can be made by nomograms (such as the Siersbaek-Nielsen nomogram) or by formulas such as the following:

$$\text{males: Ccr (ml/min)} = \frac{(140 - \text{age})\ (\text{weight in kg})}{72 \times \text{serum creatinine (mg/dl)}}$$

females: 0.85 X Ccr as determined by the above formula.

2. Determine the appropriate dosing line from Table 9. If the dosing line is not given in the table or if one chooses to use different serum half-life values (from those shownin Table 7), then the following formula can be used to determine what dosing line should be used (from those shown in Figure 3):

$$\text{dose fraction (for anephric patients)} = \frac{T_{\frac{1}{2}}\ (\text{normal renal function})}{T_{\frac{1}{2}}\ (\text{anephric patients})}$$

where $T_{\frac{1}{2}}$ is the serum half-life in hours.

3. Based on the patient's creatinine clearance and the appropriate dosing line, determine the patient's dose fraction from Figure 3.

4. Then, determine the patient's total daily dose as follows:

Patient's dose = Usual dose X patient's dose fraction,

where "usual dose" is the dose for patient's with normal renal function.

5. The total daily dose can then be divided into portions, according to whatever dosing intervals are considered to be both convenient and effective.

FIGURE 6. Nomogram for calculating the dose of an antimicrobial agent for patients with any degree of impaired renal function, to be used with Tables 8 and 9 (see text). Reproduced with permission of *Clinical Nephrology*.[63]

2. Patients with Impaired Hepatic Function

Patients with advanced liver disease also need dose reduction of some antimicrobial agents — for safety and (as a dividend) for greater cost-effectiveness.[64] Perhaps the most clear-cut example is chloramphenicol. Impaired clearance of chloramphenicol in persons with cirrhosis leads to high serum levels and increased dose-related bone marrow suppression. As a generalization, the ma-

jority of antibiotics with bactericidal mechanisms of action are eliminated primarily by the kidneys, whereas those with bacteriostatic mechanisms of action are eliminated primarily by the liver. This fortuitous generalization has, of course, important exceptions such as some of the tetracyclines.

No current liver function test permits estimation of antibiotic elimination in hepatic disease to the extent that several kidney function tests permit such estimates in renal disease. Therefore, these estimates have to be made on clinical grounds. Fortunately, the margin for error (i.e., the risk of toxicity from doses exceeding the therapeutic dose) is usually large for the drugs depending heavily on hepatic function for elimination (compared to, say, the aminoglycosides and vancomycin in patients with severe renal disease).

3. *Pregnancy*

The effects of pregnancy on antimicrobial pharmacology include (1) expanded intravascular volume (necessitating larger doses); (2) reduced plasma protein concentrations (measured serum levels could lead to underestimation of "free drug" when highly protein bound drugs are given in the usual doses); (3) increased renal blood flow and glomerular filtration rate (leading to more rapid elimination, again necessitating larger doses); and (4) decreased gastrointestinal mobility (leading to unpredictable absorption of orally-administered drugs).[65, 66]

Absolute and relative contraindications to antibiotic therapy in pregnancy, as summarized in a comprehensive recent review,[65] are shown in Table 10. Some of these contraindications, such as that for trimethoprim-sulfamethoxazole, seem arguable. Nevertheless, a clear-cut message emerges from the preceding discussion and from Table 10: in pregnancy, whenever possible, one is better off using a beta-lactam antibiotic (e.g., a penicillin or cephalosporin) compared to most alternatives. In the absence of allergy, these relatively non-toxic agents provide room for "over-medication" with minimal risk to the mother or fetus.

TABLE 10. CURRENT RECOMMENDATIONS REGARDING ANTIBIOTIC USAGE DURING PREGNANCY*

I. Agents contraindicated during pregnancy	
Chloramphenicol	Erythromycin estolate
Tetracycline	Trimethoprim-sulfamethoxazole
II. Agents to be used with caution during pregnancy	
Aminoglycosides	Metronidazole
Clindamycin	Sulfonamides
Nitrofurantoin	Isoniazid
III. Agents considered to be safe during pregnancy	
Penicillins	
Cephalosporins	
Erythromycin base	

*For discussion and reference, see text.

4. *Miscellaneous Conditions*

Many other conditions may affect antimicrobial pharmacology. A few will be mentioned briefly.

(a) Diabetes mellitus: Diabetic patients may have poor absorption of antibiotics given intramuscularly.[67, 68] This could be crucial in life threatening infections. Therefore, in such circumstances one should lean towards intravenous therapy despite the greater cost.

(b) Drug addiction: Many drug addicts have unusually rapid serum clearance of aminoglycoside antibiotics. Two-thirds of addicts required doses of gentamicin or tobramycin greater than 5 mg per kg per day in order to sustain therapeutic blood levels. It has been recommended that such patients should receive an initial dose of 8 mg per kg per day and that serum levels should be monitored closely.[69]

(c) Cystic fibrosis: Patients with cystic fibrosis have unusually rapid elimination rates of a number of antibiotics. This observation pertains especially to the aminoglycosides, which is unfortunate since these patients are frequently infected by *Pseudomonas aeruginosa*. It has been suggested that the daily dose of tobramycin for patients with cystic fibrosis should be 12 mg/kg (rather than 5 mg/kg) and that the dosing interval should be four to six hours (rather than eight hours).[70, 71]

(d) Other conditions: There are other situations, only partially defined, in which clearance of antibiotics may be especially great, necessitating higher doses. Patients with extensive burns have been shown to have high renal clearance of aminoglycosides. The same may be true of critically-ill multi-trauma victims. Hand et al. recently observed that cigarette smokers had greater uptake of rifampin, erythromycin, and clindamycin by alveolar macrophages than did non-smokers.[72] The implications of this observation are unclear, but again it illustrates that host factors may need to be taken into account in ways which may not be

immediately obvious.

IV. CURRENT COSTS

A. BACKGROUND

From the preceding discussions of cost determinants and of pharmacology, we have seen that determination of the real cost of antimicrobial therapy proves to be a complex and sometimes controversial matter. The least arguable component is the pharmacy's acquisition cost.

Current acquisition costs for various oral and intravenous antimicrobial therapy regimens are shown in Tables 11 and 12. These costs are based on average wholesale prices extant in January 1986. As we noted earlier (section II), hospital and retail pharmacies usually purchase drugs for considerably less than the average wholesale price. Because of these variables, we urge readers to regard the costs cited here only as a background for discussion.

B. INTRAVENOUS THERAPY

In Table 11, the actual cost to the hospital for each dose of intravenous antimicrobial therapy was conservatively estimated to be $5.00. Other factors being equal, agents with long serum half-lives are preferable to their alternatives. We have briefly reviewed (and shall review further in Section V) the advantages of continuous as opposed to intermittent intravenous infusion. Observations to be gleaned from Table 11 include the following:

(1) The cost of intravenous penicillin G illus-

TABLE 11. CURRENT COSTS OF SOME REGIMENS FOR INTRAVENOUS ANTIBIOTIC THERAPY*

Penicillin G **	Cefamandole	Ticarcillin/clavulanic acid
6 m.u. q6h -- $30.93	2 g q6h -- $72.40	3.1 g q6h -- $64.48
2.5 m.u. q6h -- $25.57	1 g q6h -- $46.20	3.1 g q4h -- $96.72
20 m.u. by drip -- $13.15	Cefoxitin	Gentamicin
Ampicillin	2 g q6h -- $83.72	120 mg q8h -- $28.50
2 g q4h -- $70.92	1 g q6h -- $51.86	80 mg q8h -- $24.00
2 g q6h -- $47.28	Cefonicid	Tobramycin
1 g q6h -- $33.64	2 g q24h -- $35.40	120 mg q8h -- $40.80
Nafcillin	1 g q24h -- $20.20	80 mg q8h -- $32.20
2 g q4h -- $94.49	Ceforanide	Amikacin
2 g q6h -- $62.13	500 mg q12h -- $21.14	500 mg q8h -- $75.08
1 g q6h -- $43.66	1 g q12h -- $32.29	500 mg q12h -- $50.06
Methicillin	Cefotaxime	750 mg q8h -- $103.63
2 g q4h -- $88.16	2 g q6h -- $99.52	Netilmicin
2 g q6h -- $58.74	2 g q8h -- $71.64	120 mg q8h -- $32.09
1 g q4h -- $59.08	1 g q8h -- $43.32	200 mg q12h -- $31.36
Ticarcillin	Moxalactam	Clindamycin
4 g q6h -- $62.35	2 g q8h -- $88.23	600 mg q6h -- $75.44
3 g q4h -- $78.12	2 g q12h -- $58.82	900 mg q8h -- $70.47
3 g q6h -- $52.08	Cefoperazone	600 mg q8h -- $56.58
Mezlocillin	4 g q12h -- $96.64	Metronidazole
4 g q6h -- $77.64	2 g q12h -- $53.32	500 mg q6h -- $66.52
3 g q4h -- $98.07	Ceftizoxime	1 g q12h -- $56.52
3 g q6h -- $65.38	2 g q8h -- $72.06	Chloramphenicol
Azlocillin	1 g q8h -- $43.32	1 g q6h -- $36.60
4 g q6h -- $92.04	Ceftriaxone	500 mg q6h -- $28.30
3 g q4h -- $110.70	1 g q24h -- $32.54	Doxycycline
3 g q6h -- $74.03	2 g q24h -- $58.88	100 mg q12h -- $48.66
Piperacillin	Ceftazidime	TMP/SMX, 80 mg/400 mg per amp
4 g q6h -- $84.60	500 mg q8h -- $28.30	3 amps q4h -- $141.57
3 g q6h -- $68.45	1 g q8h -- $54.89	3 amps q8h -- $70.87
3 g q4h -- $102.68	2 g q8h -- $94.77	2 amps q12h -- $34.83
Cephalothin	Imipenem	Erythromycin
2 g q6h -- $43.04	500 mg q12h -- $47.38	1 gram q6h -- $57.76
1 g q6h -- $31.52	500 mg q6h -- $94.75	500 mg q6h -- $38.88
Cefazolin	1 g q6h -- $169.50	Vancomycin
1 g q8h -- $37.21	Amdinocillin	1 g q12h -- $78.40
500 mg q12h -- $17.40	1 g q6h -- $48.30	500 mg q6h -- $88.40
1 g q6h -- $49.60	1 g q4h -- $73.20	

*Daily costs based on average wholesale prices, January 1986, and assuming an actual cost of $5.00 for each intravenous infusion (see text).
** m.u. = million units; "by drip" = by continuous infusion in a single administration set.

trates the point that cost of intravenous therapy can be quite high even when the acquisition cost is low. This cost is a function of frequent dosing. It should be noted that 2.5 million units of aqueous penicillin G given to an adult with normal renal function is therapeutically more or less equivalent to 600,000 units of procaine penicillin G given intramuscularly every 12 hours (each form of administration providing a serum concentration above 1 mcg/ml for approximately 50 percent of the dosing interval). However, the procaine penicillin G regimen would cost only $2.72 per day compared to $25.57 for the intravenous regimen.

(2) For high-dose intravenous penicillin G therapy, the most cost-effective method consists of adding the drug to 500 to 1000 ml of IV fluids and administering by continuous infusion over 24 hours. This method is about one-fourth as expensive as a popular alternative (3 million units every three hours). The pros and cons of continuous versus intermittent infusion will be discussed in section V.

(3) For antistaphylococcal therapy, nafcillin is somewhat more expensive than methicillin and considerably more expensive than cefazolin. The relative merits of these agents will be discussed later (Sections V and IX).

(4) Among the antipseudomonal penicillins (ticarcillin, mezlocillin, azlocillin, and piperacillin), ticarcillin continues to be the least expensive.

(5) Cefazolin remains the least expensive of the older "first generation" parenteral cephalosporins, although savings could be negated by using an every six hour (rather than every eight hours) dosing regimen.

(6) Cefamandole and cefoxitin — the two widely used second-generation cephalosporins — are considerably more expensive than cefazolin.

(7) All of the third generation cephalosporins are expensive. We shall compare their "intensity factors" against various microorganisms subsequently.

(8) Generic gentamicin is by far the least expensive of the currently-used aminoglycosides.

(9) Chloramphenicol is the least expensive of the "drugs of choice" for intravenous therapy of *Bacteroides fragilis* infection (clindamycin, chloramphenicol, and metronidazole). The potential for even more cost-effective oral therapy is discussed below.

(10) Intravenous trimethoprim-sulfamethoxazole is priced in such a way as to be competitive with certain of the other agents (for example, cefamandole and the newer cephalosporins) for many indications.

(11) Intravenous erythromycin therapy — currently recommended for suspected Legionnaire's disease — is relatively expensive.

(12) Vancomycin is among the most expensive agents for parenteral antibiotic therapy.

C. INTRAMUSCULAR THERAPY

Intramuscular regimens are less expensive than comparable intravenous regimens due to lower costs of supplies needed for administration. It should again be noted that the average wholesale price for procaine penicillin G, 600,000 units to be given intramuscularly twice daily, amounts to only $2.72 per day. Benzathine penicillin G is somewhat more expensive ($11.32 for administration of 2.4 million units intramuscularly).

D. ORAL THERAPY

The drug acquisition costs for oral therapy (Table 12) are considerably less than those for intravenous therapy. Several observations from Table 12 warrant brief comment:

(1) The cost of amoxicillin has been reduced so that it now compares favorably with the less well-absorbed parent drug, ampicillin.

(2) Dicloxacillin, which is probably the drug of choice for oral therapy of methicillin-sensitive *S. aureus* infections, is an extremely expensive agent with an average wholesale price of $6.23 per day for a high dose regimen.

(3) The oral carbenicillin preparation, indicated for highly selected patients with urinary tract infections, is likewise an expensive agent.

(4) Cefadroxil may be the least expensive among the oral cephalosporins listed in Table 12 because its favorable pharmacokinetics permit infrequent (daily or b.i.d.) dosing.

(5) Doxycycline is considerably more expensive than generically-prescribed tetracycline.

(6) Chloramphenicol for oral use is relatively expensive compared to other oral antibiotic preparations but is inexpensive compared to intravenous preparations.

(7) The price of the trimethoprim-sulfamethoxazole preparation has been reduced so that it now compares favorably with that of sulfisoxazole.

(8) Oral vancomycin, considered to be the drug of choice for pseudomembranous colitis due to *Clostridium difficile*, is extremely expensive.

TABLE 12. CURRENT COSTS OF SOME REGIMENS FOR ORAL ANTIBIOTIC THERAPY*

Phenoxymethyl penicillin V K
- 1 g q.i.d. -- $1.84
- 500 mg q.i.d. -- $0.92
- 250 mg q.i.d. -- $0.49

Ampicillin
- 500 mg q.i.d. -- $0.82
- 250 mg q.i.d. -- $0.42

Amoxicillin
- 500 mg t.i.d. -- $1.01
- 250 mg t.i.d. -- $0.54

Amoxicillin/clavulanic acid
- one 500 mg/250 mg tab t.i.d. -- $2.99
- one 250 mg/125 mg tab t.i.d. -- $2.00

Bacampicillin
- 400 mg b.i.d. -- $1.86
- 800 mg b.i.d. -- $3.73

Cyclacillin
- 250 mg q.i.d. -- $1.57
- 500 mg q.i.d. -- $3.14

Dicloxacillin
- 1 g q.i.d. -- $6.23
- 500 mg q.i.d. -- $3.12
- 250 mg q.i.d. -- $1.75

Carbenicillin indanyl sodium, 382 mg of carbenicillin per tab
- two tabs q.i.d. -- $5.19
- one tab q.i.d. -- $2.59

Cephalexin
- 1 g q.i.d. -- $9.90
- 500 mg q.i.d. -- $4.95
- 250 mg q.i.d. -- $2.52

Cephradine
- 1 g q.i.d. -- $10.73
- 500 mg q.i.d. -- $5.37
- 250 mg q.i.d. -- $2.73

Cefadroxil
- 1 g daily -- $2.55
- 1 g b.i.d. -- $5.12
- 2 g b.i.d. -- $10.23

Cefaclor
- 1 g q.i.d. -- $15.19
- 500 mg q.i.d. -- $7.59
- 250 mg q.i.d. -- $2.89

Tetracycline
- 500 mg q.i.d. -- $0.41
- 250 mg q.i.d. -- $0.21

Doxycycline
- 100 mg b.i.d. -- $3.26
- 100 mg daily -- $1.63

Minocycline
- 100 mg b.i.d. -- $1.63

Erythromycin stearate
- 500 mg q.i.d. -- $0.72
- 250 mg q.i.d. -- $0.37

Chloramphenicol
- 1 g q.i.d. -- $9.49
- 500 mg q.i.d. -- $4.75
- 250 mg q.i.d. -- $2.37

Clindamycin
- 300 mg q.i.d. -- $6.32
- 150 mg q.i.d. -- $3.15

TMP/SMX, 80 mg/400 mg tabs
- four tabs q.i.d. -- $4.79
- two tabs q.i.d. -- $2.40
- two tabs b.i.d. -- $1.20

TMP/SMX, 160 mg/800 mg tabs
- two tabs q.i.d. -- $3.93
- two tabs b.i.d. -- $1.97
- one tab b.i.d. -- $0.98

Sulfisoxazole, 500 mg tabs
- four tabs q.i.d. -- $1.57
- two tabs q.i.d. -- $0.78

Trimethoprim
- 200 mg daily -- $0.65
- 100 mg daily -- $0.32

Nitrofurantoin
- 50 mg q.i.d. -- $1.22
- 100 mg q.i.d. -- $2.44

Nalidixic acid
- 500 mg q.i.d. -- $2.06
- 1 g q.i.d. -- $3.28

Cinoxacin
- 250 mg q.i.d. -- $2.06
- 500 mg b.i.d. -- $2.06

Metronidazole
- 750 mg t.i.d. -- $6.30
- 500 mg t.i.d. -- $4.07
- 250 mg t.i.d. -- $2.23

Vancomycin
- 500 mg q.i.d. -- $68.40
- 125 mg q.i.d. -- $17.10

*Daily costs based on average wholesale prices, January 1986.

Hopefully, a capsule form of this agent will be released in the near future.

E. SOME COST-SAVING POINTERS

From these data, several generalizations can be made about ways to reduce costs.

First, it is better to use oral therapy whenever possible. In some circumstances, oral therapy may be equally effective compared to intravenous therapy. Three instances in which we feel that oral therapy often represents the "most drug for the money" are shown in Table 13. Each of these agents (chloramphenicol, metronidazole, and trimethoprim-sulfamethoxazole) is well-absorbed from the gastrointestinal tract and also diffuses well into body tissues and fluids including the cerebrospinal fluid. This is especially the case with chloramphenicol — serum levels after intravenous administration are only 70 percent of those achieved by oral administration. The intravenous preparation is a biologically-inactive ester which is incompletely hydrolyzed to the active form after administration, whereas such hydrolysis is not necessary with the oral preparation. Were it not for the obvious problem of bone marrow toxicity, oral chloramphenicol would be widely used.

Second, when choosing a drug against a particular pathogen, it is worthwhile to take cost into account. For example, a number of the agents shown in the table would be effective for most methicillin-sensitive *S. aureus* infections. Choosing nafcillin or vancomycin might be according to currently recommended therapy, but would be more expensive than alternatives such as cefzolin.

Finally, the need for frequent dosing should be questioned especially for drugs having favorable half-lives. For example, metronidazole and vancomycin can be given every 12 hours rather than every six hours, and clindamycin can be given every eight hours rather than every six hours. Our prescribing habits, often calling for frequent dosing intervals, can be quite expensive.

TABLE 13. "THREE FOR THE MONEY" --- INSTANCES IN WHICH ORAL THERAPY MAY BE AS EFFECTIVE AS INTRAVENOUS THERAPY (AND MUCH LESS EXPENSIVE)*

	Chloramphenicol	Metronidazole	TMP/SMX
INTRAVENOUS THERAPY			
Peak serum concentration	9 mcg/ml	20-25 mcg/ml	3.4/47.3 mcg/ml**
Cost	$36.60	$66.52	$69.66
ORAL THERAPY			
Peak serum concentration	12 mcg/ml	11.5 mcg/ml	2-4/80-100 mcg/ml**
Cost	$9.49	$5.43	$1.97

*Data are based on previous tables and on doses of one gram every six hours for chloramphenicol, 500 mg every six hours for metronidazole, and 160 mg/800 mg every six hours for trimethoprim/sulfamethoxazole (TMP/SMX).

**Concentrations of trimethoprim and sulfamethoxazole, respectively.

F. A FORMULA FOR COMPARISONS

Even the most patient reader might conclude by this point that the number of variables makes cost comparisons difficult, at best. We have thus far presented data pertaining to MIC's (Tables 4, 5, and 6), peak serum concentrations (Table 7), and cost (Tables 11 and 12). Is it possible to draw simple conclusions from these data?

We suggest that one might estimate "how much drug one gets for the money" by use of the following formula:

$$\text{Therapeutic ratio/\$/day} = \frac{\text{Peak serum level/ MIC-90}}{\text{Daily cost.}}$$

This derived value might alternatively be called the "*I.Q. per dollar per day*" (see Section III) or the "*daily kill per dollar.*"

We acknowledge that this approach is simplistic. A more accurate estimate would utilize differential equations to determine the intensity factor after a single dose.[48] Use of the daily cost in the above formula takes the intensity factor into account in the sense that standard dosing intervals (such as those shown in Tables 11 and 12) are based to a large extent on serum half-life values. The above formula would provide an overestimation of the true cost-effectiveness of highly protein-bound agents (Table 7).

An advantage of such a simple formula is that it can be used to determine quickly the most cost-effective drug for an individual patient. One would need to know only the MIC data for the patient's infecting microorganism (supplied by the microbiology data), the true or relative cost of the therapeutic alternatives (supplied by the hospital pharmacy), and the usual serum concentrations (from sources such as Table 7).

V. PROSPECTUS: THE BETA-LACTAM ANTIBIOTICS

A. AN OVERVIEW

1. The Legacies of Fleming and Brotzu

Alexander Fleming's discovery of antimicrobial activity elaborated by the mold, *Penicillium notatum*, is remembered by all physicians and most lay persons as among the greatest of all medical discoveries. Knighted for his serendipity, Fleming's place in medical history seems secure for all times.

By contrast, how many persons can identify Professor Giuseppe Brotzu? Brotzu's isolation of *Cephalosporium acremonium* from water obtained near a Sardinian sewer initiated the era of cephalosporins. Parenteral cephalosporins are now the single most costly item in many hospital pharmacy budgets and are frequently the most

controversial item on the agendas of pharmacy and therapeutics committees.

This year marks the 45th anniversary of the commercial production and clinical use of penicillin G — the beginning of the modern era of antimicrobial chemotherapy. Penicillin G and its derivatives continue to be the most frequently listed "drugs of choice" by various authorities. For instance, *The Medical Letter* recently considered a penicillin derivative to be a drug of choice for 25 of 54 bacterial pathogens. The cephalosporins were not listed as a drug of choice for anything.[73]

These recommendations may change. Many of the cephalosporins have extremely favorable pharmacokinetics, owing primarily to their long serum half-lives. The short-serum half-lives of most penicillins frequently make these agents less cost-effective than the cephalosporins. Listings of "drugs of choice" for many indications seem to give weight to the greater clinical experience with the penicillins. In the Spring of 1986, it seems time to acknowledge that many of these preferences have about the same relevance as, say, pre-season college football polls have by November. Experience substantiates the efficacy of cephalosporins for many infectious syndromes. Lowering of costs would make the cephalosporins first-choice agents for a wide range of indications.

2. *The Beta-lactams: An Expanding Kinship Group*

It is becoming increasingly appropriate to refer to the penicillins, the cephalosporins, and certain other agents as "the beta-lactam antibiotics." Use of this term serves to emphasize not only their common possession of a beta-lactam ring but also certain other features: (1) a common and usually bactericidal mechanism of action; (2) a typically high therapeutic index (resulting from favorable pharmacology and relative lack of toxicity); and (3) potential for cross-allergenicity.

It may once have been appropriate to refer to these agents as a "family." Rampant proliferation makes it more apt to describe them today as a loosely-knit kinship group. Many excellent reviews of the beta-lactam antibiotics are available. Here, we will attempt a concise overview from the perspective of cost-effectiveness.

A structural overview of therapeutically-useful beta-lactam compounds is shown in figure 7. In each structure, the beta-lactam ring is shown in bold lines for clarity. Note that in the penicillins,

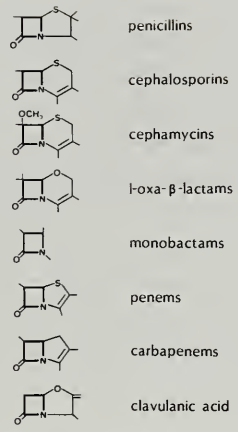


FIGURE 7. Structural overview of eight categories of therapeutically-useful beta-lactam compounds. In each instance, the rectangle outlined by bold lines represents the beta-lactam ring (see text).

the beta-lactam ring has been fused to a five-membered, sulfur-containing thiazolidine ring, whereas in the cephalosporins the beta-lactam ring is fused to a six-membered dihydrothiazine ring. The cephamycins (e.g., cefoxitin) differ from the cephalosporins in that a methoxy group has been placed at the 7-alpha position of the 7-aminocephalanosporanic molecule. The 1-oxa-beta-lactams (e.g., moxalactam) differ in that oxygen has replaced sulfur in the six-membered ring.

The upper four compounds in Figure 7 are familiar to most physicians through therapeutic use. The lower four compounds in Figure 7 are relatively new. These recent additions to our armamentarium will no doubt be extremely helpful in certain patients. Their relation to the older agents in terms of cost-effectiveness is unclear at this time.

The monobactams are unique in that the beta-lactam ring stands alone. Although side chains emerge from the ring's corners, the ring itself is not fused to anything (in contrast to the penicillins and cephalosporins). Later, we shall review the potential usefulness of the first such agent, aztreonam. The penems differ from the penicillins in that there is an unsaturated double bond between the second and third carbon atoms of the five-membered thiazolildine ring and no substituents at the C-6 position of the thiazolidine ring. In turn, the carbapenems differ from the penems in that a carbon atom rather than a sulfur atom is present at the 1-position of the five-membered ring. The first carbapenem, imipenem, has now been released and as we shall see has an extremely wide spectrum of activity.

Finally, clavulanic acid (Figure 7) is one of two well-studied beta-lactam compounds (the other is sulbactam) with very little intrinsic antibiotic activity. Clavulanic acid differs from the carbapenems in that oxygen replaces carbon at the 1-position of the five-membered ring. Clavulanic acid and sulbactam have high affinities for the enzymes (beta-lactamases) capable of inactivating these agents. By inhibiting these enzymes, they enhance the usefulness of simultaneously-administered beta-lactamase-susceptible antibiotics.

3. Binding Proteins and Beta-lactamases

With the exception of these last-mentioned compounds, the beta-lactam agents all seem to have similar mechanisms of action. Simply put, they inhibit cell-wall synthesis. To be more precise, they inhibit synthesis of peptidoglycan. To be still more precise, they inhibit the final stage of peptidoglycan synthesis, which involves transpeptidation reactions (the reactions that result in cross-linking of strands of N-acetylmuramic acid and N-acetylglucosamine). The cell wall of a typical gram-positive coccus contains about 20 to 30 peptidoglycan strands, compared to three to five such strands in the cell wall of a typical gram-negative rod. On this basis, one would predict that gram-positive cocci would be more susceptible to these agents than would gram-negative rods — as was indeed the case prior to recent molecular modifications. A breakthrough in our understanding of the mechanism of action of the beta-lactam antibiotics came with the discovery, in 1972, of the enzymes involved in transpeptidation reactions. Now known as penicillin-binding proteins, six or more enzymes are currently recognized. The penicillin-binding proteins contain the target sites for drug action. In order to reach the targets, the antibiotic must elude two bacterial defense systems. The first of these is the outer portion of the cell wall, which resists diffusion of antibiotic into the cell. The second bacterial defense consists of beta-lactamases.[74]

Penicillinase produced by *Staphylococcus aureus* became the first beta-lactamase of clinical importance. Today, more than 90 percent of community-acquired S. *aureus* strains possess this enzyme, rendering penicillin useless. We now recognize numerous and diverse beta-lactamases produced by both gram-positive and also by gram-negative bacteria (and also by other microorganisms including mycobacteria and *Nocardia*).

The genetic material coding for beta-lactamase production can be contained either in plasmids (extrachromosomal bits of DNA) or in the organism's chromosomes. The beta-lactamases of gram-positive bacteria are exoenzymes, diffusing from the bacterium into the surrounding medium to destroy the approaching antibiotic. By contrast, the beta-lactamases of gram-negative bacteria lie in wait for the approaching antibiotic just beneath the outer portion of the cell wall (in the periplasmic space), where they destroy the antibiotic after it has reached and even entered the cell wall. Compared to beta-lactamases of gram-positive bacteria, the beta-lactamases produced by gram-negative bacteria are more diverse in that they may affect either penicillins, cephalosporins, or both. The ability of gram-negative rods, especially hospital-associated pathogens, to produce beta-lactamases has become an increasingly important problem.

B. THE PENICILLINS

1. Currently Available Agents

A summary of currently-available penicillin derivatives is shown in Table 14. Traditionally, the penicillins are grouped into four categories: penicillin G and its acid-stable derivatives such as penicillin V; the antistaphylococcal, beta-lactamase-resistant penicillins (methicillin, nafcillin, and others; the extended spectrum aminopenicillins (ampicillin); and the antipseudomonal penicillins (carbenicillin, ticarcillin, and others). Somewhat surprisingly, the antistaphylococcal penicillins have shown little decrease in price over the years. However, the most important controversies for pharmacy and therapeutics committees revolve around the antipseudomonal penicillins, especially as to the place of the newer derivatives (Mezlocillin, azlocillin, and piperacillin). We shall review each of these groups in turn. First, we shall make some general comments about the cost-effectiveness of penicillins.

Typically short serum half-lives (Table 7) render most of the penicillins relatively cost-ineffective, compared to certain alternatives, in many situations calling for high-dose intravenous antibiotic therapy due in large measure to the cost of administration. As we shall see, this is strikingly

TABLE 14. THE PENICILLINS

1. Natural penicillins	
Penicillin G	many trade names
Penicillin V	many trade names
Phenethicillin	Maxipen, Syncillin, Darcil
2. Aminopenicillins	
Ampicillin	many trade names
Amoxicillin	Amoxil, Polymox, Larotid, Robamox, Trimox
Bacampicillin	Spectrobid
Cyclacillin	Cyclapen
Hetacillin	Versapen
Epicillin	
Pivampicillin	
3. Antistaphylococcal penicillins*	
Methicillin	Staphcillin, Celbenin, Dimocillin
Nafcillin	Unipen, Nafcil
Oxacillin	Prostaphlin, Bactocill, Resistopen
Dicloxacillin	Veracillin, Dycill, Pathocil, Dynopen
Flucloxacillin	
4. Antipseudomonal penicillins**	
Carbenicillin	Pyopen, Geopen
Indanyl carbenicillin	Geocillin
Ticarcillin	Ticar
Mezlocillin	Mezlin
Azlocillin	Azlin
Piperacillin	Pipracil

*Also called penicillinase-resistant penicillins

**Some classifications separate mezlocillin and pipeacillin from the others due to their extended spectrum of activity against other pathogens in addition to Pseudomonas aeruginosa.

the case with penicillin G. Thus, there is a tremendous temptation to replace penicillins in most situations with other agents such as cephalosporins.

However, we should remember that there are several areas in which the penicillins perform well, but in which the cephalosporins do not (Table 15). For instance, gas gangrene due to *Clostridium perfringens* has occurred in patients receiving cephalothin for therapy of traumatic wounds — an occurrence which correlated with a 50 percent in vitro resistance of *Clostridia* strains to cephalothin.[74] Enterococci are traditionally resistant to cephalosporins, and not surprisingly enterococcal superinfection has become especially common in patients treated with the new, broad-spectrum penicillins. Thus, the penicillins will remain important in clinical medicine. Used properly, tremendous cost-savings can be realized with these drugs despite their generally short serum half-lives.

TABLE 15. SOME PATHOGENS AGAINST WHICH PENICILLIN G PROVIDES EFFECTIVE THERAPY, WHEREAS CEPHALOSPORINS MAY NOT

1. Enterococci
2. Some strains of Clostridia
3. Eikenella corrodens
4. Listeria monocytogenes
5. ? spirochetes including T. pallidum

2. Penicillin G

In terms of acquisition cost (Table 14), penicillin G is perhaps the cheapest of parenteral antibiotics. Pharmaceutical representatives seldom, if ever, detail physicians regarding penicillin G. A recent comprehensive textbook of antibiotic pharmacology contains separate chapters for nearly every antibiotic except penicillin G.[36] Nevertheless, penicillin G continues to be listed by sources such as *The Medical Letter* as the drug of first choice against more bacterial pathogens than any other agent. However, even penicillin G therapy poses some significant issues in cost-effectiveness.

Penicillin G pharmacology provides an excellent example of the need to take the therapeutic indication into account in tailoring a dose. Recalling our earlier discussion of the inhibitory quotient (Section III), it is instructive to consider the relationship of penicillin G preparation, dose, and route of administration to MIC values (Figure 8).[75] This relationship explains a number of clinical axioms:

(1) It is difficult to improve on the results of benzathine penicillin G (Bicillin) therapy of streptococcal pharngitis; even though the serum levels after Bicillin administration are quite low, the group A streptococcus is exquisitely susceptible so that the inhibitory quotient is greater than ten.

(2) Similarly, it is difficult to improve on the results of procaine penicillin G, 600,000 units intramuscularly every 12 hours, for therapy of uncomplicated pneumococcal pneumonia.

(3) On the other hand, high-dose intravenous penicillin G is necessary for therapy of serious enterococcal infections, since the MIC values against enterococci are typically quite high (this difficult subject is discussed at greater length in Section VII, below).

Since both the benzathine and procaine preparations are quite inexpensive, our discussion will focus largely on the intravenous administration of crystalline ("aqueous") penicillin G.

There is a long-standing controversy about whether penicillin G is more effective by continuous or intermittent infusion. Traditionally, many authorities have argued in favor of intermittent infusion. Several more-or-less theoretical considerations, supported by some laboratory data or animal experimentation, support intermittent infusion:

(1) Intermittent infusion, by allowing low, subinhibitory trough levels, may enable the bacteria to re-grow and thus again become vulnerable to the bactericidal action of penicillin (which requires actively growing, dividing cells).

(2) Intermittent infusion may give higher levels in peripheral infected loci, at least in animal models involving implantation of a fibrin clot.[76]

(3) Intermittent infusion provides predictable high peak and low trough concentrations, compared to the intermediate concentrations provided by continuous infusion.

One of us recalls a professor who taught that during the first 24 hours of acute bacterial meningitis, penicillin G should be given as one million units intravenously every hour. At our conservative estimate of $5 per intravenous infusion, administration cost would be $120 per day. Why not merely place the 24 million units of penicillin G into a single bag of fluid (or perhaps divide this amount between two bags) and give the drug by continuous infusion? This would reduce the cost to $5 or $10 per day, and probably require much less nursing attention even allowing for the need to observe the infusion apparatus from time to time. The cost difference is substantial ($128.15

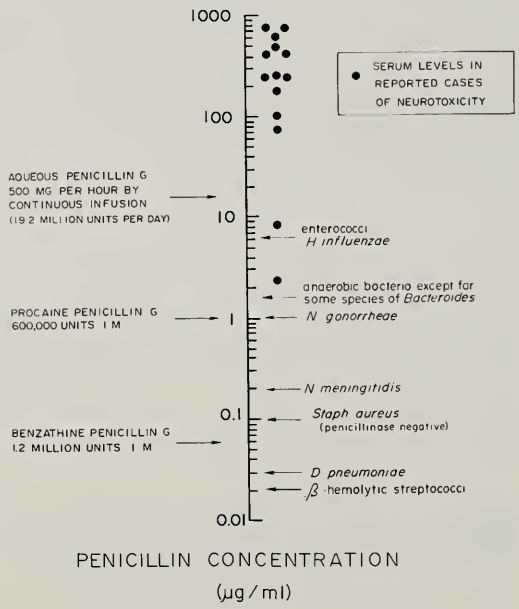


FIGURE 8. Relationship of penicillin G serum concentration achieved with various regimens (left-hand arrows) to the upper range of MIC values against various microorganisms (right-hand arrows). Penicillin G concentrations (mcg/ml) is shown on a logarithmic scale. Note that even penicillin G is not entirely a "magic bullet," since neurotoxicity tends to occur with high serum concentrations. Reproduced with permission of *Annals of Internal Medicine*.[75]

versus $13.15)! We are aware of no clinical (as opposed to theoretical) evidence that this latter method is less effective than that proposed by our esteemed mentor. This illustration serves as an apt example of a lesson that all of us need to learn and re-learn: our theoretically-based fantasies can be extremely expensive.

There is little standardization of the dosage of intravenous penicillin G. We have found that physicians sometimes prescribe intravenous penicillin G in multiples of 300,000 units — apparently as a carry-over from intramuscular procaine penicillin G dosing concepts. Not infrequently, we have observed the administration of 600,000 units of penicillin G intravenously with the apparent expectation that the result will be similar to the same dose of procaine penicillin G intramuscularly. However, assuming normal renal function, the short serum half-life of intravenously-administered penicillin G could result in dangerously subtherapeutic blood levels for all but the most sensitive pathogens (such as the pneumococcus). That this error occurs is not surprising, since one can find these two preparations treated as though interchangeable in the most prestigious textbooks and journals.

In order to achieve the therapeutic equivalent of 600,000 units of procaine penicillin G intramuscularly every 12 hours by the intravenous route, we recommend 2.5 million units of crystalline penicillin G every six hours. Assuming normal renal function, this dose should enable the serum concentration to exceed 1 mcg/ml about 50 percent of the time. However, for indications such as pneumococcal pneumonia, procaine penicillin G will usually be more cost-effective.

3. *Oral Acid-stable Penicillins*

We shall mention the oral acid-stable penicillins (penicillin V and phenethicillin) only briefly. These agents are relatively inexpensive (Table 12). Although giving higher blood levels than orally-administered penicillin G, one must remember that these agents are, in general, somewhat less active than penicillin G. This is especially the case against gram-negative microorganisms. The administration of probenecid to diminish renal tubular secretion of penicillin continues to be an effective way to obtain more mileage from these popular and inexpensive preparations.

4. *The Aminopenicillins (Ampicillin, Amoxicillin, and Others)*

This group of compounds extended the usefulness of penicillin G to include various gram-negative microorganisms, including such common pathogens as *H. influenzae* and *E. coli*. Their activity is generally similar to penicillin G against other mutually-susceptible microorganisms (in general, they are slightly less active against the pneumococcus and streptococci of groups A and B but slightly more active against enterococci and *Listeria monocytogenes*).

Cost-effectiveness issues pertaining to intravenous ampicillin will be discussed later. Oral ampicillin is quite inexpensive ($0.82 per day average wholesale price for the high dose of two grams per day in divided dosage). A cost-effectiveness issue concerns whether the extra price of the various analogues (amoxicillin, cyclacillin, and epicillin) and pro-drugs (talampicillin, pivampicillin, and bacampicillin) is justified. Let us examine these issues.

Amoxicillin, the major analogue in clinical use in the United States, differs from ampicillin only by a single hydroxyl group. It is significantly better absorbed, resulting in blood levels about twice as high as those achieved after ampicillin. This advantage may be of dubious benefit in the therapy of urinary tract infections due to mutually-susceptible pathogens, since ampicillin is well-concentrated in the urine (provided renal function is reasonably good). However, this advantage may be significant in the therapy of tissue infections, especially invasive infections due to *H. influenzae*. Another advantage of amoxicillin is that it may cause less gastrointestinal distress. The additional cost of amoxicillin compared to ampicillin is now negligible (Table 12). Cyclacillin and epicillin (the latter being unavailable in the United States) are also slight modifications of ampicillin with similar activity.

Bacampicillin is an ester of ampicillin with no inherent antibacterial activity. However, it is better absorbed than ampicillin and, following absorption, is completely hydrolyzed to free ampicillin. Further, unlike ampicillin, it is actually better absorbed in the presence of food. The resulting high blood levels led to promotions of bacampicillin based on the concept of pulse dosing (that is, b.i.d. rather than q.i.d.). However, clinical trials suggest that the in vivo efficacy of bacampicillin is similar to that of ampicillin. Simi-

larly, superiority compared to ampicillin has not been demonstrated for hetacillin and pivampicillin (available in Europe but not in the United States).

Compared to the other penicillin derivatives, the aminopenicillins are relatively frequently associated with rashes. The well-known association between classic infectious (Epstein-Barr virus) mononucleosis and ampicillin rash is so predictable as to virtually form a diagnostic test for mononucleosis. This association extends to cytomegalovirus mononucleosis and also extends to the other aminopenicillins. Diarrhea is relatively common following ampicillin administration (up to 12 percent of cases), and some data suggest that ampicillin has been associated with even more cases of pseudomembranous colitis due to *Clostridium difficile* than clindamycin.

The results of a number of studies suggest that diarrhea is less commonly associated with the newer aminopenicillins compared to ampicillin. One reviewer has argued that "all current evidence speaks in favour of a change from ampicillin to modern aminopenicillins for oral therapy."[77] Whether such an argument is truly justified from the cost-effectiveness point of view remains to be determined. At the present time, we would tend to take the conservative position that generically-available ampicillin may, for most purposes, be the most cost-effective choice. However, the price gap between ampicillin and amoxicillin has narrowed considerably, so that one could argue that amoxicillin has become "more drug for the money."

5. The Antistaphylococcal Penicillins

Synthesis of methicillin met the challenge posed by penicillinase-producing *S. aureus* strains during the 1950's. Methicillin became the prototype of beta-lactamase-resistant penicillins. Analysis of the data shown in Tables 4 and 7 reveals the significant differences between methicillin and related drugs. Methicillin is generally less active on a weight basis compared to nafcillin and oxacillin, but is also less protein bound. These opposing factors tend to cancel out, so that in equivalent dosages these agents have similar efficacy.

Methicillin is less expensive based on cost of acquisition (Table 11). However, it can be argued that the cost of consequences makes methicillin more expensive than its competitors. This is due entirely to the occurrence of interstitial nephritis — reported to occur in up to 17 percent of patients with staphylococcal bacteremia who were treated with methicillin.[78] Although often heralded by the occurrence of eosinophils in blood and urine, interstitial nephritis can develop relatively abruptly. Occasionally life-threatening, this complication can result in the permanent need for hemodialysis.

In contrast to methicillin, interstitial nephritis is rare (indeed, almost reportable) from nafcillin and oxacillin. Many clinicians prefer these latter agents for routine use. An argument can be made that methicillin should be the preferred agent when therapy will be limited to two weeks' duration (since interstitial nephritis seldom develops within the first two weeks of therapy). This sensible recommendation would, however, be hard to put into practice since one seldom knows in advance how long therapy will be needed for serious staphylococcal infection. Neutropenia and hepatitis seem to have been especially associated with oxacillin;[79, 80] interestingly, patients with oxacillin hepatitis seem to tolerate nafcillin without difficulty.[80]

The oral antistaphylcoccal agents are expensive (Table 12). Patients frequently provide grim accounts of the impact of prescriptions for these drugs on their household budgets. Dicloxacillin is generally the preferred agent in this country, on the basis of superior blood levels compared to orally-administered nafcillin or cloxacillin (flucloxacillin, which may give higher free drug levels than dicloxacillin, is not available in the United States). Absorption of dicloxacillin is markedly impaired by the simultaneous presence of food (thus, the drug should be taken on an empty stomach, generally 30 minutes before meals and at bedtime). Administration of probenecid may enable one to obtain more mileage from these prescriptions. However, there is a clear need for more cost-effective alternatives for oral therapy of disease due to *S. aureus*.

6. The Alpha-carboxypenicillins (Carbenicillin and Ticarcillin) — "First Generation Antipseudomonal Penicillins"

Carbenicillin is a relatively simple modification of penicillin G, consisting of the addition of an alpha-carboxy group to the benzyl side chain. This resulted in an extended spectrum to include most strains of *Pseudomonas aeruginosa* and also

strains of indole-positive *Proteus, Providencia, Enterobacter*, and *Serratia* species.

The introduction of carbenicillin caused much fanfare. The banner headline in *The Houston Post* screamed: "New Drug Cures Cancer Patients." The point to be made was that carbenicillin, for the first time, offered to patients the relative safety of a beta-lactam compound combined with activity against *Pseudomonas aeruginosa*. However, both of these desiderata were fulfilled to a lesser extent than first met the eye.

First, carbenicillin therapy imposes a substantial risk of dose-related side effects (Table 16). With a sodium content of 4.7 mEq per gram, some patients developed heart failure at the recommended doses of 30 to even 40 grams of carbenicillin per day. Other problems included hypokalemic alkalosis (attributable to the drug's acting as a non-reabsorbable anion in the renal tubules); bleeding diathesis (due to an unanticipated effect on platelet function); and neurotoxicity (occurring mainly in patients with renal failure given inappropriately high doses).

Second, the activity of carbenicillin against *Pseudomonas* was to some extent an unfulfilled promise. *Pseudomonas aeruginosa* rapidly acquires resistance to carbenicillin when the drug is used alone. The major usefulness of carbenicillin was for synergism with aminoglycosides in the therapy of serious *Pseudomonas aeruginosa* infections (and occasional infections by other gram-negative rods). Such infections are encountered primarily in critically ill patients with cancer. What relevance, then, might carbenicillin have in day-to-day clinical practice?

The finding that the activity of carbenicillin resembled that of ampicillin against most other pathogens and included many strains of *Bacteroides fragilis* led to promotion of carbenicillin as broad-spectrum monotherapy. Carbenicillin was especially promoted for surgical infections ("mixed infection may not require mixed therapy"). This was sometimes misleading. For example, carbenicillin resembles ampicillin in that it is ineffective against penicillinase-producing strains of *S. aureus* and is also ineffective against most *Klebsiella* isolates.

An oral form of carbenicillin (carbenicillin indanyl sodium or indanylcarbenicillin) became available for therapy of urinary infections. Blood levels from this preparation are extremely low, but urinary levels may be adequate for many pathogens. Concern was again expressed that use of this agent for monotherapy (that is, as the sole agent) might lead to emergence of resistant microorganisms. And such resistance frequently occurred.

Ticarcillin, a simple modification of carbenicillin, possesses greater activity against *Pseudomonas aeruginosa*. Therefore, ticarcillin can be used at a lower dose for serious infections — decreasing the risk of the above-mentioned dose-related side effects. In the minds of many, ticarcillin made carbenicillin essentially obsolete.

TABLE 16. DOSE-RELATED SIDE EFFECTS OF ANTIPSEUDOMONAL PENICILLINS

1. Sodium overload
2. Hypokalemic alkalosis
3. Bleeding diathesis
4. Neurotoxicity
5. Hepatic toxicity
6. Neutropenia

7. *The Acylaminopenicillins (Mezlocillin, Azlocillin, and Piperacillin) — The "Second Generation Antipseudomonal Penicillins"*

Recently, three new penicillin derivatives have led to considerable controversy among pharmacy and therapeutics committees. These are basically derivatives of ampicillin, and are termed acylaminopenicillins (or alternatively, ureidopenicillins). In general, these agents are more active than the alpha-carboxypenicillins (carbenicillin and ticarcillin) against *Pseudomonas aeruginosa*. In addition, the spectrum of activity has been expanded to include other pathogens such as *Klebsiella pneumoniae* and *Serratia marcescens*. Compared to carbenicillin and ticarcillin, these new agents may be active against greater percentages of isolates of other gram-negative species, such as *E. coli*.[81] These newer agents have significantly less sodium than carbenicillin and ticarcillin (1.85 mEq/gram for mezlocillin and piperacillin and 2.17 mEq/gram for azlocillin), and other side effects may also be somewhat less frequent. It may be appropriate to refer to these agents as

"second generation antipseudomonal penicillins."

Theoretically, a case can be made that these newer agents should replace the older ones whenever data suggest greater *in vitro* activity. Azlocillin and piperacillin should be the "antipseudomonal penicillins of choice," to be used in combination with an aminoglycoside for proven infection due to *Pseudomonas aeruginosa*. The place of mezlocillin is less clear, but a strong argument can be made that hospitals should bid mezlocillin competitively against ticarcillin. This is especially the case because mezlocillin, unlike piperacillin, carbenicillin, ticarcillin, and even penicillin G, seems to have negligible effect on platelet function and therefore seems less likely to be associated with bleeding diatheses. The elimination rate of mezlocillin, unlike that of ticarcillin, tends to slow as the dosage is increased. This latter observation may allow mezlocillin to be given at lower dosages, resulting in cost savings.[82]

Numerous clinical trials, recently reviewed by Drusano et al., have now compared these newer agents with ticarcillin and carbenicillin.[83]

- In six trials comparing mezlocillin and ticarcillin, overall response rates were 89 percent with mezlocillin and 76 percent with ticarcillin ($P = 0.09$, which is not significant).
- In three trials comparing mezlocillin and carbenicillin, complete resolution was obtained in 72 percent of mezlocillin-treated patients and 63 percent of carbenicillin-treated patients (again, not significant).
- In 19 trials comparing piperacillin with carbenicillin (alone or with gentamicin), the overall response rate was 83 percent with piperacillin and 79 percent with carbenicillin.

One might conclude that there may be a slight trend in favor of the new agents, but it is certainly not convincing. Many arguments can be put forth on other grounds in favor of routine use of these agents. Against such arguments stands the observation that we have had less clinical experience with the newer agents, and therefore may not be yet aware of all of the potential side effects. For instance, mezlocillin was found in two studies to cause pseudoproteinuria (protein in the urine detected by the usual dipstick method but not confirmed by the sulfosalicylic acid method) — a laboratory abnormality which, if not appreciated, could lead to unnecessary studies. Given to patients with cystic fibrosis in high doses, piperacillin was found to cause a 38 percent incidence of a serum-sickness-like reaction.[84] The conclusion by Drusano et al. seems quite sound:

"The position of these compounds in the physician's armamentarium will . . . depend upon the infecting organism, antimicrobial susceptibility patterns, and not least of all, cost."[83]

8. Amdinocillin

Amdinocillin, known outside of the United States as mecillinam, is a novel semisynthetic penicillin with a unique mechanism of action. Unlike other penicillins, which bind to several of penicillin-binding proteins, amdinocillin combines principally with one (PBP-2). Cells affected by amdinocillin become ovoid rather than filamentous before rupturing. Alone, amdinocillin is active against many Enterobactericae; it is not reliably active against *Pseudomonas aeruginosa*, *H. influenzae*, or anaerobic pathogens, and is less active than ampicillin against most gram-positive pathogens.

Interest in amdinocillin has centered especially around potential synergism with other beta-lactam compounds. Such synergism might be predicted on the basis of its novel mechanism of action. At the time of this writing, this observation is conceptually interesting but would seem to have few implications for cost-effective antimicrobial therapy for most patients.[85, 86]

C. THE CEPHALOSPORINS

1. Bridging the Generation Gap

Earlier, we established that it is unlikely that the cephalosporins will entirely replace the penicillins (Table 15). We also reviewed the reluctance of various authorities to recognize the cephalosporins as "drugs of choice." Nevertheless, wide spectrums of activity and relative safety, combined with favorable pharmacokinetics, are likely to make cephalosporins "cost-effective" agents of choice within the foreseeable future.

The cephalosporins are economically important. They are an apt starting point for any review of antimicrobial usage within a hospital. Most authorities now hold the viewpoint that a rational policy for cephalosporin usage is almost certain to result in significant savings.

In this section, we shall make little attempt to recite the now-voluminous literature on the cephalosporins. Instead, we shall attempt to place the available agents in perspective. We shall empha-

size the areas in which we feel that the older agents remain the most cost-effective choices, and shall review areas in which we see exciting potentials for the newer ones. Although antibiotics, unlike people, do not really belong to one or another "generation," we shall retain the "generation" concept since most physicians have used this concept to acquire familiarity with these compounds (Table 17). The generation concept is not iron-clad; at times it is arbitrary. For instance, cefazolin has somewhat better activity than cephalothin against some gram-negative organisms and might be considered a "second generation" agent.

2. Toxicity and Cross-allergenicity

Early experience with cephalothin brought out occasional side effects which had been described rarely if at all with penicillin G, such as acute renal failure, pseudomembranous colitis, and even pancytopenia.[87-90] These effects might have been perhaps anticipated, since cephalothin seems to be more toxic to human cells compared to penicillin G.[91] The major question about cephalosporin safety, however, has been the extent of cross-allergenicity with penicillins.

Physicians are naturally concerned about the use of cephalosporins in patients with a prior history of penicillin allergy. Anaphylaxis has occasionally occurred in patients given cephalosporins despite a history of penicillin allergy (and would, of course, add immeasurably to costs — litigation costs being added to the "cost of consequences"). Initial studies based on retrospective methodology suggested that up to 10 percent of patients with histories of penicillin allergy showed cross-reactivity with cephalosporins. Recent estimates suggest that this figure should be revised downwards. Remarkably, not a single anaphylactic reaction took place in the pre-marketing trials of four third-generation cephalosporins released in this country.

In our opinion, a history of penicillin allergy should not contraindicate the administration of cephalosporins unless the reaction was of the immediate type (type I allergy according to the Gell-Coombs classification — that is, IgE-mediated allergy with manifestations such as anaphylaxis, angioneurotic edema, or urticaria). Other reactions to penicillins, including the more commonplace maculopapular, measles-like rash, should of course be noted in the hospital record. However, we feel that in the absence of a history of type I allergic reaction to penicillins, cephalosporins can be given with the confident expectation that there is no greater-than-average risk of serious allergic reaction.

Saxon reported the results of three small prospective studies in which patients who possessed IgE antibodies to penicillin were challenged with cephalosporins.[92] He found that the possession of IgE antibodies to penicillin antigenic determinations did not predict IgE-mediated responses after administration of cephalosporins, and concluded that "cephalosporins are likely to be well tolerated even in the patient with documented IgE antibody to penicillin." Beam and Spooner found that 18 of 20 patients with histories of type I reactions to penicillin did not react to cephalosporin antigens.[93] The availability of a battery of appropriate skin test antigens would help to clarify, for individual patients, those who can receive cephalosporins with impunity even in the face of a history of previous symptoms suggestive of type I allergy to penicillins.

TABLE 17. THE GENERATIONS OF CEPHALOSPORINS

I. First generation	
Cephalothin	Keflin
Cephradine	Cefadyl
Cephradine	Velosef, Anspor
Cefazolin	Ancef, Kefzol
Cefadroxil	Duracef, Ultracef
Cephalexin	Keflex
II. Second generation	
Cefamandole	Mandol
Cefoxitin	Mefoxin
Cefaclor	Ceclor
Cefonicid	Monocid
Ceforanide	Precef
Cefuroxime	Zinacef
Cefotetan	
Cefmetazole	
Cefotiam	
III. Third generation	
A. Agents without especially good activity against Pseudomonas aeruginosa	
Cefotaxime	Claforan
Moxalactam	Moxam
Ceftizoxime	Ceftizox
Ceftriaxone	Rocephin
Cefmonoxime	Cefmax
Cefbuperazone	
B. Agents with good antipseudomonal activity	
Cefoperazone	Cefobid
Ceftazidime	Fortaz
Cefsulodin	Cefomonil
Cefpiramide	

3. *Grounds for Comparisons*

Most cephalosporins provide effective therapy against numerous pathogens with a wide margin of safety. Only two exceptions come to mind — cephalondine (removed from the market because of nephrotoxicity) and moxalactam (rendered virtually obsolete because of bleeding problems). The plethora of acceptable agents makes choice of one over another often seem quite arbitrary.

When the cephalosporins were last reviewed in *The Journal of the South Carolina Medical Association* (1977), 14 criteria were listed by which one cephalosporin might be compared with another.[94] Time has proven these criteria to be valid. A slightly expanded version of the previous criteria is presented in Table 18.

The major grounds for comparison among these agents are spectrum of activity, serum half-life, extent of side-effects and cost. With the exception of cost, the other parameters can be correlated, to a remarkable extent, with chemical structure.

Figure 9 shows the basic cephalosporin structure and sites of molecular modification. The key substitutions made in recent years involve positions A and D.[30] Novel substitutions at position A have expanded the range of activity against gram-negative microorganisms but have resulted in less activity against common gram-positive pathogens such as *S. aureus*. In some situations (as we shall discuss later), this loss of activity against gram-positive bacteria assumes clinical relevance. Novel substitutions at position D have been associated with prolonged serum half-lives. Other parameters including cost being equal or similar, agents with long half-lives are generally preferred for convenience and economic savings. Thus, it is

(Continued on page 157)

TABLE 18. SOME PARAMETERS FOR COMPARISONS AMONG CEPHALOSPORINS

I. Antimicrobial activity

- A. Spectrum of activity (e.g., MIC-90 data against various organisms)
- B. Susceptibility to beta-lactamases and extent of inoculum effect
- C. Inducibility of beta-lactamase production

II. Clinical pharmacology

- A. Serum half-life in both normal and anephric patients
- B. Extent of removal by dialysis
- C. Extent of protein binding
- D. Volume of distribution
- E. Concentrations achieved in urine, bile, cerebrospinal fluid, and other body fluids and tissues

III. Side effects

- A. Incidence of clinical bleeding
- B. Possession of a methyltetrathiazole ring (see text)
- C. Sodium content per gram
- D. Association with pseudomembranous colitis
- E. Incidence of phlebitis with intravenous administration
- F. Incidence of pain with intramuscular administration
- G. Incidence of hypersensitivity reactions
- H. Occurrence of unexpected toxicity (including nephrotoxicity)

IV. Miscellaneous considerations

- A. Accumulated clinical experience
- B. FDA-approved indications for use
- C. Cost

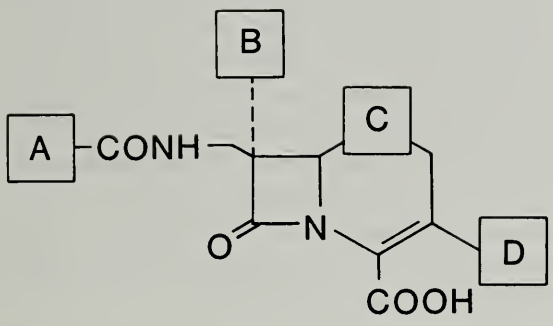


FIGURE 9. Molecular modifications of the cephalosporins have taken place especially at the positions designated here as A, B, C, and D. Novel substitutions at position A have dramatically lowered MIC's against many gram-negative microorganisms. Bulky side chains placed at position D tend to prolong the serum half-life.

useful to group these agents according to serum half-life (Table 19). Whether elimination is heavily dependent upon renal function, hepatic function, or both becomes an additional pharmacologic consideration in certain patients.

Certain cephalosporins contain a methylthiotetrazole ring at position D (Figure 9). These include cefamandole, moxalactam, and cefoperazone, and also the investigational agents cefotetan, ceftmetazole, and cefmenoxime. This addition confers improved antimicrobial activity. The trade-off consists of two unwanted effects: prolongation of the prothrombin time which may be associated with clinical bleeding and disulfiram (Antabuse) type reactions during concomitant alcohol use.

4. The First Generation Cephalosporins (In Praise of Cefazolin)

Cephalothin (Keflin), introduced in 1962, remains the prototype of the older cephalosporins. No cephalosporin yet surpasses its activity against gram-positive microorganisms, including *S. aureus*. For all intents and purposes, most of the other agents (such as cephapirin and cephradine) compare favorably with cephalothin, and therapeutic substitution should be permissible.

Like most reviewers, we generally prefer cefazolin among the older cephalosporins primarily because of its longer serum half-life. Cefazolin is somewhat more susceptible to beta-lactamase than is cephalothin.[95] This observation has caused some investigators to question whether it should be used in place of cephalothin for serious staphylococcal infections such as endocarditis. However, most investigators feel that the clinical relevance of this difference is not well-established. An argument can be made that cefazolin is the most cost-effective parenteral agent for serious methicillin-sensitive *S. aureus* infections (this issue will be discussed in more detail later). Having negligible non-renal elimination, cefazolin becomes extremely cost-effective in patients with severe renal failure. Doses as small as 500 mg to one gram intravenously after each dialysis provide effective blood levels at all times.

In summary, the longer serum half-life of cefazolin makes it the most cost-effective choice for most patients (Table 20). Being made by two major American drug firms, cefazolin is subject to competitive bidding, thereby improving the acquisition price. The other first-generation cephalosporins are nevertheless excellent drugs, and either lowering their acquisition prices still further or (possibly) devising novel methods for administration might improve their competitive posture.

TABLE 19. CLASSIFICATION OF THE CEPHALOSPORINS ACCORDING TO SERUM HALF-LIVES*

I. Short half-life (less than 1.5 hours)		
Cephalothin	Cefamandole	Cefotaxime
Cephapirin	Cefoxitin	Cefmenoxime
	Cefuroxime	
II. Intermediate serum half-life (1.5 to 3 hours)		
Cefazolin	Ceforanide	Moxalactam
		Cefoperazone
		Ceftizoxime
		Ceftazidime
		Cefsulodin
III. Long serum half-life (greater than 3 hours)		
	Cefonicid	Ceftriaxone
	Cefotetan	

*In each group, so-called first-generation agents appear in the left-hand column, second-generation agents in the center column, and third-generation agents in the right-hand column. We should emphasize that, as with other data in this issue, values may vary among laboratories. For example, according to some data cefazolin wold be in category I rather than category II and ceforanide would be in category III rather than in category II.

TABLE 20. SOME ADVANTAGES OF CEFAZOLIN

1. Excellent activity against S. aureus
2. Excellent activity against E. coli and other gram-negative rods
3. Long serum half-life
4. Accumulated clinical experience
5. Two major U.S. manufacturers, enabling competitive bidding
6. Long shelf-life in frozen bags

We shall make two brief points about the first-generation cephalosporins available for oral use. First, most authorities feel that these drugs are over-utilized. Second, the longer serum half-life of cefadroxil (Duricef) permits daily or twice-daily dosing and therefore makes this agent perhaps more cost-effective compared to cephalexin (Keflex) and cephradine (Velosef). However, the latter agents can also be given twice-daily rather than four times-daily for some indications.

5. *The Second Generation Cephalosporins (What is the Real Role of Mandol, Mefoxin, and the Others?)*

a. Cefamandole and Cefoxitin: Cefamandole (Mandol) and cefoxitin (Mefoxin) were both released in 1978. Their putative advantage over the first-generation cephalosporins consisted of expanded spectra of activity. *The Medical Letter* suggested that "until more data become available, both cefamandole and cefoxitin should generally be reserved for special situations."[96] Yet within two years, more than $250 million was spent on these drugs each year in the United States, amounting to nearly 60 percent of antibiotic expenditures in the United States. Is such expenditure for these agents justified?

Many authorities would issue a resounding "No!" This seems to be especially the case with cefamandole, cefoxitin representing a greater therapeutic advance.[97]

The only real advantages of these agents over older ones are their activities against many Enterobacteriaceae strains resistant to the first-generation cephalosporins (both cefamandole and cefoxitin), against *H. influenzae* (cefamandole), and against *Bacteroides fragilis* (cefoxitin). Each of these areas deserves scrutiny.

First, let us examine their improved activity against many Enterobacteriaceae isolates, such as strains of *E. coli, Enterobacter, Klebsiella,* indole-positive *Proteus,* and *Providencia.* These advantages apply mainly to hospital-acquired infections. They are of dubious advantage for community-acquired infections, such as *E. coli* pyelonephritis. Even against hospital-associated strains, emergence of resistance during therapy has been reported especially with *Enterobacter* infections treated with cefamandole.[98, 99] Cefoxitin, by virtue of its 7-alpha-methoxyl group (Figure 7), resists hydrolysis by most beta-lactamases, in contrast to cefamandole, and hence may be the more valuable of the two agents.

Cefamandole has been promoted for its activity against *H. influenzae.* However, cefamandole is less active than ampicillin against ampicillin-sensitive strains. Against ampicillin-resistant strains, cefamandole may appear to be active *in vitro* — yet this activity may be misleading, since there is frequently a significant inoculum effect, tolerance, and ineffective killing. Alternative agents, including some of the third-generation cephalosporins, may be more effective.

Cefoxitin has been promoted for its activity against *Bacteroides fragilis.* Cefoxitin is still generally considered the most active cephalosporin against this troublesome anaerobic pathogen. However, the MIC-90 value against *B. fragilis* is relatively high (usually around 16 mcg/ml) and resistance may develop by novel mechanisms.[100] Thus, cefoxitin is not considered to be a drug of choice against life-threatening *B. fragilis* infection in that clindamycin, chloramphenicol, and especially metronidazole have more reliable activity. Recently, cefoxitin was reported to be associated with an 8.2 percent incidence of clinical bleeding in a retrospective survey; this observation has yet to be verified.[101] Both cefamandole and cefoxitin have come to be widely used for surgical prophylaxis. We shall review whether this use is cost-effective in a later section.

b. Cefaclor: Cefaclor has been widely used as an oral antibiotic. It is quite expensive compared to the first-generation cephalosporins marketed for oral use (cephalexin and cephradine) (Table 12) and whether its wide use — again justified in part by putative greater activity against *H. influenzae* — is warranted can be questioned.

c. Cefonicid: Cefonicid (Monocid) is a recently-introduced second-generation cephalosporin with an exeptionally long serum half-life. Cefonicid is almost entirely excreted by the kidneys, so that again it would be an exceptional bargain in persons with renal insufficiency. Its spectrum of activity against gram-negative microorganisms resembles that of cefamandole. However, MIC values against *S. aureus* are relatively high. In clinical trials, therapeutic failures occurred in an unacceptable number of cases of *S. aureus* endocarditis. A number of trials suggest that cefonicid may be of value for surgical prophylaxis. Although the relatively high MIC's against *S. aureus* provide some ground for concern, the extremely favorable pharmacokinetics

make single-dose prophylactic therapy with such an agent an attractive possibility.[102]

d. Ceforanide: Ceforanide (Precef), chemically similar to cefamanandole and cefonicid, has a longer serum half-life than most available agents (although not as long as cefonicid). Like cefonicid, it has been marketed especially for surgical prophylaxis; also like cefonicid, its MIC's against *S. aureus* are relatively high. Its activity against *H. influenzae* is less than that of cefamandole, cefuroxime, or cefonicid. It would appear that, should its price be considerably lower than the other competing agents, ceforanide might find a place in our armamentarium despite the medical letter's flat statement that "there is no reason to use it."[103] This place might include not only surgical prophylaxis[104-107] but also therapy of syndromes such as pneumonia and even endocarditis.[108, 109]

e. Cefuroxime: Cefuroxime (Zinacef) possesses similar, or slightly better activity against gram-negative organisms compared to cefamandole. Unlike the other second-generation cephalosporins, cefuroxime penetrates reasonably well into the cerebrospinal fluid in patients with meningitis; this combined with activity against *H. influenzae* has made it a reasonable choice for certain pediatric infections.[110]

f. Cefotetan: Cefotetan, which has been widely tested in Europe and seems likely to be released soon in the United States, may rival cefoxitin for use in patients with suspected *Bacteroides fragilis* infection.[111, 112] Whether cefotetan should be considered as a second or third generation cephalosporin is open to some debate, since its activity against most Enterobacteriaceae compares favorably with that of the various third-generation agents. Cefotetan also has reasonable activity against *Bacteroides fragilis*, although somewhat less than that of cefoxitin. The major advantage of cefotetan is its relatively long serum half-life. Thus, it may ultimately replace cefoxitin in situations calling for broad-spectrum activity with "good but not excellent" coverage against *B. fragilis*.

6. The Third Generation Cephalosporins (Are the Aminoglycosides Obsolete?

a. Why the excitement? Seldom has a group of antibiotics generated as much excitement as have the so-called third-generation cephalosporins. Most of the interest reflects extremely low MIC values against aerobic gram-negative microorganisms (Tables 5 and 6).

We should reiterate that these newer agents are generally less effective against gram-positive pathogens (especially against *S. aureus*) than are the older, first-generation agents. Also, with the possible exception of moxalactam, none of these agents rival cefoxitin for activity against anaerobic pathogens such as *Bacteroides fragilis*.

The low activity against aerobic gram-negative rods is relevant primarily for infections due to hospital-associated pathogens. Some of these agents are active not only against most Enterobacteriaceae, but also against many strains of *Pseudomonas aeruginosa*. This has led to active questioning as to whether these agents could replace the aminoglycosides for routine therapy of hospital-acquired infections. Given the well-known toxicity and low therapeutic index of the aminoglycosides, such usage offers potential advantage for thousands of patients hospitalized each year.

An unanswered question concerns the extent to which wide usage of the third generation cephalosporins will lead to the emergence of resistance. There are several mechanisms by which bacteria can develop resistance to these agents: decreased cell wall permeability (denying access to the targets), development of beta-lactamases, either *de novo* or by transfer of resistance from other bacteria (inactivating the antibiotics), or altered penicillin binding proteins (so that the targets themselves are no longer affected by the antibiotics) (Figure 10). Of these, the best-studied has been the development of new beta-lactamases.[113] Preliminary evidence suggests that emergence of resistance to these new agents may develop more rapidly than was the case with the aminoglycosides.

The major bacterial species that have shown resistance to these newer agents are *Enterobacter*, *Serratia*, and *Pseudomonas aeruginosa*. These bacteria typically possess inducible beta-lactamases. In hospitals in which third-generation cephalosporins have been used extremely widely, a gradual but perceptible decrease in the percentage of susceptible strains has been noted.

Resistance to third-generation cephalosporins has been especially noted in intensive care units in which these agents were extensively used. These have included surgical intensive care units and burn units. Recently, we encountered a situation

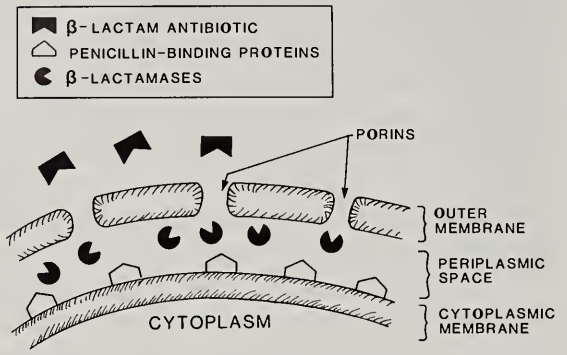


FIGURE 10. In order to kill bacteria, beta-lactam antibiotics must penetrate the outer cell wall and reach the penicillin-binding proteins involved in transpeptidation reactions. In gram-negative bacteria, the antibiotic penetrates cell wall channels known as porins. Beta-lactamases present in the periplasmic space can destroy the antibiotic before it reaches the binding site (see text).

in a neonatal intensive care unit in which gentamicin-resistant *Klebsiella pneumoniae* occurred — after eleven years of extremely heavy gentamicin use for routine empiric therapy for suspected sepsis. It was elected to replace gentamicin with cefotaxime. The strategy worked in that gentamicin-resistant *Klebsiella pneumoniae*

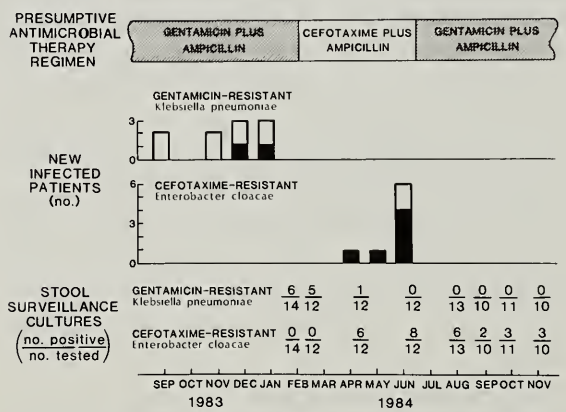


FIGURE 11. Experience in a neonatal intensive care unit summarized here suggests that resistance to newer cephalosporins (if widely used) might emerge more rapidly than has occurred with the aminoglycosides. An outbreak of gentamicin-resistant *Klebsiella pneumoniae* occurred after eleven years of heavy use of gentamicin in the unit. Replacement of gentamicin with cefotaxime for routine presumptive therapy of sepsis was followed by prompt disappearance of gentamicin-resistant *Klebsiella* both from infected patients and also from stools of patients in the unit. Within ten weeks, however, an outbreak of cefotaxime-resistant *Enterobacter cloacae* made its appearance. Reproduced with permission from the *American Journal of Diseases of Children*.[114]

were eliminated from the unit. However, within three months there was emergence of cefotaxime-resistant *Enterobacter cloacae* as a problem pathogen (Figure 11).[114]

b. New strategies for meningitis: Widespread resistance of gram-negative rods to the third generation cephalosporins would be a great loss, if but for a single reason: the ability of these drugs to penetrate into the cerebrospinal fluid.

Meningitis due to gram-negative rods has been a significant clinical problem. Although chloramphenicol has extremely favorable pharmacology, its bacteriostatic mechanism of action and the tendency of bacteria to become resistant during therapy are significant limitations. Thus, patients with gram-negative meningitis have frequently required intravenous aminoglycoside therapy. Since parenteral aminoglycosides penetrate poorly into the cerebrospinal fluid, since even intralumbar administration of aminoglycosides fails to produce adequate levels in the lateral ventricles, and since ventriculitis is present in many patients, placement of a ventricular reservoir for direct injection of aminoglycosides has often been necessary. This form of therapy is not without hazard.

Considerable experience now indicates that the newer cephalosporins are effective therapy for gram-negative rod meningitis.[115-117] They have now become the drugs of choice for gram-negative meningitis due to susceptible Enterobacteriacae, and rival traditional agents for therapy of meningitis due to *S. pneumoniae*, *H. influenzae*, and *N. meningitidis*. There are now so many effective compounds that it is difficult to choose among them. Let us briefly review them.

c. Cefotaxime: Cefotaxime was the first of these agents to be marketed in the United States.[118] This agent is active against a wide variety of gram-positive and gram-negative pathogens (Tables 4, 5, and 6). As with most of the third-generation cephalosporins, there are several holes in its coverage: enterococci, *Listena monocytogenes*, *Pseudomonas aeruginosa*, *Acinetobacter calcoaceticus*, and *Bacteroides fragilis* — to name but a few. Experience with meningitis proved to be quite favorable. Cerebrospinal fluid concentrations of both the parent drug and also the desacetyl derivative far exceeded the MIC's of most pathogens causing meningitis.[119]

A limitation of cefotaxime is its relatively short serum half-life. Therefore, cefotaxime has gener-

ally been given on an every six hour dosing schedule (and every four hours for bacterial meningitis). Cefotaxime is, however, metabolized to a desacetyl derivative which retains some (although not all) of the antimicrobial activity of the parent drug. Because of its desacetyl derivative, an argument can be put forward that cefotaxime can be given every eight hours or even every twelve hours to many patients, with resultant cost savings.[120]

d. Moxalactam: When moxalactam was introduced shortly after cefotaxime, many authorities predicted that its usefulness would soon eclipse the latter's. The basic superiority of moxalactam appeared to be its longer serum half-life. Although its activity against gram-positive pathogens was less than that of cefotaxime, its activity against *Bacteroides fragilis* was greater. Initial clinical experience with moxalactam was extremely favorable.[121-126]

Not long after its introduction, Weitekamp and Aber reported five patients with a reversible bleeding diathesis associated with platelet dysfunction and marked prolongation of the prothrombin time in patients receiving moxalactam.[127] It was then recognized that this was a relatively common problem at some medical centers. Frequent monitoring of the prothrombin time and prophylactic vitamin K administration were soon recommended to correct this deficiency; however, this did not correct the platelet dysfunction. These effects appear to be due, at least in part, to its possession of a methyltetrathiazole group. With less toxic alternatives available, moxalactam is becoming the first obsolescent third generation cephalosporin.

e. Cefoperazone: Cefoperazone (Cefobid), the third of these agents to be released, has two advantages over its predecessors.[128] The first is activity against *Pseudomonas aeruginosa* — activity considered by most investigators to be insufficient for truly definitive therapy against this troublesome pathogen, yet often "good enough" for coverage during empiric therapy (prior to the availability of culture and susceptibility testing). Its reasonably good coverage against gram-positive pathogens resembles that of cefotaxime, and it seems to be more active against enterococci in vitro than the other third-generation cephalosporins (although the significance of this activity is unclear).[129] Activity against Enterobacteriaceae may be somewhat less compared to cefotaxime and moxalactam (Table 5); however, cefoperazone may be somewhat less prone to induce new beta-lactamase production by gram-negative bacteria.[130]

The second major advantage of cefoperazone is its relatively long serum half-life (Table 7) — a feature which again should be cost-saving. In contrast to most beta-lactam drugs with long serum half-lives, cefoperazone is excreted primarily by the biliary tract. However, renal excretion accounts for about 25 percent of elimination, so that the drug remains useful for urinary tract infections. Possession of dual hepatic and renal excretion allows leeway in dose adjustment. It seems likely that only patients with combined liver and renal dysfunction need significant dose reduction.

Cefoperazone, like moxalactam, possesses a methyltetrathiazole ring. Bleeding has not occurred to the extent seen with moxalactam. Nevertheless, monitoring of prothrombin times and administration of vitamin K to some patients seems advisable. Gastrointestinal side effects (chiefly diarrhea) may be greater with cefoperazone than with the other agents. One group of Swedish investigators suggested that "cefoperazone seems to give intestinal side effects of such magnitude that its use should be limited to selected purposes."[131] However, it should be emphasized that antibiotic-related diarrhea can occur with any of these agents, and whether cefoperazone is truly unique in this regard remains unsettled.

f. Ceftizoxime: Ceftizoxime (Ceftizox) resembles cefotaxime in nearly every way. There may be slight differences (for example, arguably greater activity against *Bacteroides fragilis* and *Acinetobacter* compared to cefotaxime), but the clinical relevance of these differences is unclear.[132]

The major advantage of ceftizoxime over cefotaxime is its longer serum half-life, enabling "true" every eight hour dosing. Elimination is quite slow in patients with renal disease, in whom ceftizoxime would be a bargain. The major advantage of ceftizoxime over moxalactam and cefoperazone is its lack of a methyltetrathiazole ring. Penetration of ceftizoxime into cerebrospinal fluid appears to exceed that of the other third-generation cephalosporins. Clinical experience with cefotaxime in many settings, including meningitis, has been generally favorable.

g. Ceftriaxone: The fifth third-generation

cephalosporin to be released, ceftriaxone, has as its major advantage an exceedingly long serum half-life (Table 7). Ceftriaxone is the first of the third-generation cephalosporins suitable for dosing on an every 24 hour schedule. This offers the potential for significant savings due to reduced administration costs.[133-135]

Ceftriaxone appears favorably active against most common pathogens compared to the other third-generation cephalosporins, although its activity against *Pseudomonas aeruginosa* is less than that of cefoperazone. Again, clinical experience has been favorable. The only real concern about ceftriaxone appears to be that it is relatively highly protein bound compared to other agents. However, penetration into experimentally-infected fibrin clots is favorable,[136] suggesting that there is sufficient free drug to reach infected loci.

The initial average wholesale price of ceftriaxone was set relatively high compared to the other third-generation cephalosporins. It can be argued that this increase is more than offset by the cost reduction made possible by the need for fewer infusions per day. This issue remains to be settled.

h. Ceftazidime: Ceftazidime is the first of a new group of compounds with excellent activity against *Pseudomonas aeruginosa*.[137] Clinical experience indicates that it may be effective against many *Pseudomonas* infections.[138, 139] Activity against other gram-negative microorganisms is also quite good (Tables 5 and 6). However, activity against *S. aureus* is less than that of the other third-generation cephalosporins. Some investigators have therefore concluded that the anti-staphylococcal coverage offered by this drug is insufficient to "cover" *S. aureus*, which would necessitate use of a second drug for empiric therapy in patients without a well-defined pathogen.[140-143]

As with the other newer cephalosporins, the ultimate role of ceftazidime is unclear. On the one hand, many authorities would not use this agent alone for serious infections due to *Pseudomonas aeruginosa*.[144] Thus, its role could be analagous to that of the antipseudomonal penicillins — an agent employed primarily for synergism with an aminoglycoside. On the other hand, the excellent spectrum of activity and favorable pharmacokinetics of this agent could make it the third-generation cephalosporin equivalent of cefazolin. Uniquely among the newer cephalosporins, ceftazidime is being marketed in the United States by two major manufacturers (with a third being on the horizon). Thus, as with cefazolin, competitive bidding could become a significant cost-saving factor.

i. Beyond Ceftazidime: Many other beta-lactam compounds, some with good antipseudomonal activity are being studied. From the foregoing, it is evident that development of compounds with better activity against one or another bacterial species nearly always requires a trade-off in which we must settle for lesser activity against other microorganisms. Cefsulodin, for instance, lacks activity against many microorganisms susceptible to older agents yet is quite active against *Pseudomonas aeruginosa*.[145, 146] As a recent editorialist pointed out: "A cephalosporin that has good activity against staphylococci and *Bacteroides fragilis*, as well as high potency against the Enterobacteriaceae and *Ps aeruginosa*, must be the Holy Grail of the pharmaceutical industry at present."[147]

D. THE MONOBACTAMS

In this and the following three sections, we shall review four new classes of beta-lactam compounds. Although the role of these new compounds in day-to-day practice has yet to be defined, each of these classes offers the potential for still more cost-effective therapy.

The monobactams were discovered in 1979 by the Squibb Institute for Medical Research after systematic analysis of soil obtained from the New Jersey pine barrens. Earlier, we reviewed the skeleton structure of these compounds (Figure 7), noting that the beta-lactam ring stands alone (or is monocylic, as opposed to the bicyclic penicillin and cephalosporin structures). Molecular modification is possible at the corners of the ring, and indeed this has been carried out with the first member of this group, aztreonam (Figure 12). The activity of aztreonam is almost exclusively limited to aerobic gram-negative rods, including beta-lactamase-producing species. Aztreonam has essentially no activity against aerobic gram-positive bacteria or against anaerobic microorganisms. Thus, aztreonam offers the potential for uniquely targeted therapy against aerobic gram-negative rods.[148]

The pharmacology of aztreonam appears to be favorable.[149] The drug is widely distributed in body fluids and tissues. It penetrates well into bronchial secretions,[150] making it potentially

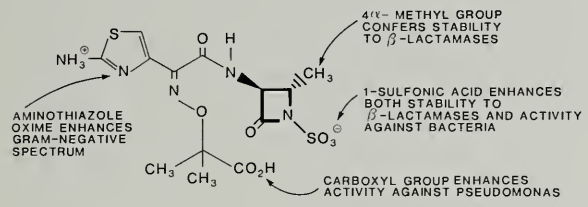


FIGURE 12. Aztreonam. Appropriate molecular modifications to the beta-lactam ring (outlined in bold lines) dramatically enhance the usefulness of this novel compound.

useful for gram-negative pneumonia, and also penetrates the meninges in the presence of inflammation,[151] making it potentially useful for bacterial meningitis. Both *in vivo* and *in vitro* studies suggest that there is no cross-allergenicity between aztreonam and the penicillins and cephalosporins.[152] Thus, aztreonam offers the potential for treating patients who have a history of allergy to other beta-lactam agents.

Aztreonam has been used successfully in difficult-to-treat infections due to *Pseudomonas aeruginosa* and beta-lactamase producing Enterobacteriaceae.[153-156] It is also effective for gonorrhea.[157] Its lack of anaerobic activity might make it a useful agent for gut decontamination of aerobic gram-negative rods (as in neutropenic cancer patients).[158, 159] The only major side effect noted so far has been the emergence of enterococcal infections — a side effect also notoriously observed with the newer cephalosporins.

E. THE CARBAPENEMS

Earlier (Figure 7), we reviewed the basic structure of another new family of compounds, the carbapenems. At the time of this writing, the first of these agents, imipenem, is about to be marketed. We shall briefly review this additional advance in antimicrobial therapy.

Imipenem belongs to the thienamicin class of antibiotics (so-named after the first compound in this group, which was produced from the mycelium *Streptomyces cattleya*). Its uniqueness is its extremely broad spectrum of activity. It possesses broad aerobic gram-negative coverage against Enterobacteriaceae and *Pseudomonas aerguinosa* similar to the coverage given by the third-generation cephalosporins. Unlike the latter agents, however, imipenem also has excellent activity against gram-positive aerobic bacteria and against virtually all anaerobic pathogens.[160-165]

Imipenem appears to be the most potent of known antibiotics. MIC's against 30,655 isolates described in the world literature indicated that 98 percent of isolates of all kinds were inhibited by concentrations less than 8 mcg/ml. In contrast to some of the newer cephalosporins, imipenem seems to be rapidly bactericidal and to exhibit little or no inoculum effect.[166] The major resistant bacteria were one of the enterococcal species (*S. faecium*) and two of the infrequently-encountered Pseudomonas species (*Pseudomonas cepacia* and *Pseudomonas maltophilia*).

Offsetting its superior activity, at first, was its inactivation by the kidneys. This turned out to be due to a brush-border dipeptidase in the renal tubules. This temporary setback was countered by the development of a potent and specific inhibitor of the renal dipeptidase known as cilastatin. Thus, the clinically-available formulation consists of a mixture of imipenem and cilastatin. In other respects, the pharmacology of imipenem appears to be favorable, with the possible exception of its ability to give adequate CSF levels in patients with meningitis.

At first glance, the proper role of imipenem-cilastatin would appear to be for broad-spectrum presumptive therapy of seriously ill patients. Preliminary experience suggests that this will prove to be the case. In a randomized study of 163 patients in Europe, the imipenem-cilastatin combination was found to be therapeutically superior compared to the traditional combination of gentamicin and clindamycin.[167] Other experience has been similarly favorable.[168, 169] It was, however, associated with a higher incidence of infusion-related thrombophlebitis.

Experimentally, imipenem/cilastatin has been found to be effective in endocarditis due to gram-positive cocci.[170] This is an important observation, since it indicates — again — that in seeking broader gram-negative coverage with such a compound one will not "give up" activity against common gram-positive microorganisms (as is the case, to some extent, with all of the third-generation cephalosporins).

F. BETA-LACTAMASE INHIBITORS

The last group of compounds for review in this section (Figure 7) are the beta-lactamase inhibitors, of which clavulanic acid has become the prototype. These agents are conceptually straightforward: they bind to beta-lactamase enzymes. Thus, in a sense, they serve as "blocking backs" for beta-lactamase susceptible antibiotics used in combination.

At the time of this writing, two fixed combinations are available: amoxicillin-clavulanic acid (Augmentin) and ticarcillin-clavulanic acid (Timentin).[171, 172] The amoxicillin-clavulanic acid combination, marketed for oral therapy, seems especially useful for respiratory infections due to beta-lactamase-producing strains of *H. influenzae*.[173] Other indications include difficult-to-treat urinary tract infections[174] and soft tissue infections such as bite wounds.[175] An unanswered question is whether this combination will be as effective against *S. aureus* as, say, dicloxacillin. A clear-cut demonstration of such efficacy would make Augmentin a welcome addition to our limited arsenal of oral agents for staphylococcal disease.

Administering clavulanic acid along with ticarcillin extends ticarcillin's spectrum to include beta-lactamase-producing *S. aureus* and improves ticarcillin's activity against certain gram-negative rods including *Klebsiella* and *Bacteroides* species.[176, 177] The ticarcillin/clavulanic acid combination has been used successfully for intravenous therapy of seriously ill patients.[178, 179] *The Medical Letter*, with its characteristic conservatism, recently concluded that ticarcillin/clavulanic acid "could be helpful in clinical situations in which *S. aureus*, aerobic gram-negative bacilli, and anaerobes might all be present, but older drugs and drug combinations appear to be equally effective." While this may be the case, the ticarcillin-clavulanic acid combination seems to be yet another instance in which competition leading to lower acquisition costs might change current recommendations.

VI. PROSPECTUS: OTHER ANTIMICROBIAL AGENTS

A. THE AMINOGLYCOSIDES

1. General

The aminoglycosides are complicated sugars more properly called aminoglycosidic aminocyclitol compounds. A list of these compounds, some of which are currently used for therapy and some of which are not, is shown in Table 21.[180]

The explosive development of new beta-lactam antibiotics has not yet rendered the aminoglycosides obsolete. Indeed, the overall quantity of aminoglycosides used in the United States has remained remarkably stable, with approximately four million patients receiving these drugs each year.[181] New developments in this area have not been as dramatic as with the beta-lactam agents, but there is still considerable ground for controversy over what constitutes optimum cost-effectiveness.

TABLE 21. THE AMINOGLYCOSIDES AND AMINOCYCLITOLS

I. Pure aminocyclitols

Spectinomycin

II. Aminoglycosidic aminocyclitols

A. Streptidine derivatives

Streptomycin

B. 2-deoxystreptamine derivatives

Neomycin	Dibekacin
Paromomycin	Gentamicin *
Kanamycin *	Sisomicin
Tobramycin *	Netilmicin *
Amikacin *	

*Currently available for intravenous use in the United States.

The advantage of aminoglycoside antibiotics over other agents consists of their potent, rapidly bactericidal action against aerobic gram-negative rods including, in many instances, *Pseudomonas aeruginosa*. Although newer cephalosporins often duplicate this coverage, the aminoglycosides have stood the test of time. Resistance to aminoglycosides is cited as a problem at teaching centers, but has occurred at a remarkably slow rate at most hospitals. This is in contrast to initial experience with third generation cephalosporins, which (as we have just reviewed in Section V) suggests that resistance may develop relatively rapidly. Also in contrast to the newer penicillins and cephalosporins, aminoglycosides exhibit little or no inoculum effect (see Section III). Development of resistance during therapy is rare.

2. Limitations of the Aminoglycosides

The major limitations of the aminoglycoside antibiotics fall into three areas: spectrum of activity, clinical pharmacology, and toxicity.

These agents have minimal activity against

gram-positive microorganisms and essentially no activity against gram-negative microorganisms. It is true that they are nearly always active in vitro against both *S. aureus* and *S. epidermidis;* however, this activity is marginal in the sense that the MIC values are dangerously close to the peak serum concentrations. Activity against other common gram-positive pathogens including the pneumococcus is usually lacking. One editorialist, commenting on advertisements for the use of tobramycin in pneumonia, called it a "blunder drug" — use of tobramycin alone would lead to predictable failure for therapy of pneumococcal pneumonia.[182]

Emphasis on monitoring peak serum concentrations of gentamicin and tobramycin underscores the marginal relationship of blood levels to MIC values for these agents. Pharmacology is somewhat more favorable for kanamycin and its newer derivative, amikacin. In addition to marginal pharmacokinetics, these agents have two important limitations pertaining to their mechanism of action. First, they work very poorly, if at all, under anaerobic conditions since their uptake into bacterial cells involves an oxygen-dependent system. This may explain their failure to eradicate the aerobic gram-negative component of mixed aerobic/anaerobic infections despite favorable results from in vitro susceptibility tests. Second, they work poorly under acidic conditions. In vitro, one can demonstrate that the activity of aminoglycosides increases by as much as 100-fold as one moves from an acidic pH (e.g., 4.5) to an alkaline pH (e.g., 8.0). Typically, infected loci, including endobronchial secretions in patients with pneumonia,[183] tend to be acidic. In difficult-to-treat urinary tract infections, it is sometimes helpful to alkalinize the urine with bicarbonate in order to enhance aminoglycoside activity. Besides these two limitations, aminoglycoside antibiotics seem to be bound and inactivated by pus to a greater extent that other agents.

The third major limitation of the aminoglycoside antibiotics is their well-publicized toxicity. Receiving the most publicity has been their nephrotoxicity, which involves injury to proximal tubular epithelial cells. This toxicity may be augmented by other antibiotics — cephalothin (Keflin) was the first to be recognized in this regard. Nephrotoxicity tends to develop in critically-ill patients. Recent studies indicate that age, shock, and pre-existing liver disease, high initial peak serum levels, and duration of therapy are risk factors to this toxicity,[184, 185] which is considered to be reversible if patients survive the acute illness.

Aminoglycoside ototoxicity, in contrast to nephrotoxicity, is irreversible. Many elderly persons, upon audiometric testing, prove to have the type of high-frequency hearing loss which can easily be made worse by administration of aminoglycosides. Much has been made of the observation that the toxicity of certain of these agents (e.g., gentamicin and tobramycin) tends to be more vestibular than cochlear. However, it has been pointed out that vestibular toxicity can also be permanently disabling.[186, 187]

The relative incidence of nephrotoxicity and ototoxicity from the various aminoglycosides is an important point which, however, remains controversial. A summary from a survey of reports of clinical trials published between 1975 and 1982, involving approximately 10,000 patients, is shown in Table 22.[188] More recent reviewers similarly concluded that gentamicin was the most nephrotoxic of the currently-used parenteral aminoglycosides; no differences in ototoxicity could be demonstrated.[189]

Other toxicities of the aminoglycosides include neuromuscular paralysis (especially in patients given certain anesthetics or in patients with myasthenia gravis), allergic reactions, and acute brain syndromes. The latter include confusion, delirium, and acute psychosis — findings easily mis-attributed to other causes in critically ill patients.[190-192]

3. *Older agents*

Streptomycin, the prototype aminoglycoside, is still used for the therapy of tuberculosis, tularemia, and endocarditis (with penicillin), but in general has been replaced by the newer agents. Kanamycin, otherwise an excellent drug, lacks activity against *Pseudomonas aeruginosa.* An argument could be made that kanamycin might be an especially cost-effective drug in hospitals with a low incidence of *Pseudomonas* infection. However, at the time of this writing, kanamycin is seldom used except in some neonatal nurseries.

Neomycin, which is poorly absorbed from the gastrointestinal tract, is sometimes used as a so-called "non-absorbable antibiotic" to decrease the gut flora, as in surgical prophylaxis or in the therapy of hepatic coma. The term "non-absorba-

ble" is a misnomer, since enough neomycin may get into the bloodstream to afford measurable serum levels and in occasional patients with renal impairment, serum levels can be high enough to cause deafness.

Neomycin and kanamycin, and occasionally the other agents, have been used for irrigation of wounds from time to time. In our opinion, prolonged wound irrigation with aminoglycoside antibiotics is a dangerous practice, since one cannot predict how much of a drug will be absorbed from an inflamed or granulating wound surface. Irreversible and total deafness from this practice has been well-documented.[193]

4. Gentamicin and Tobramycin

Especially because of its activity against *Pseudomonas aeruginosa*, gentamicin quickly replaced kanamycin as the preferred aminoglycoside for broad-spectrum empiric therapy soon after its introduction. Tobramycin is slightly more active (i.e., MIC two to four-fold lower) than gentamicin against most *Pseudomonas aeruginosa* isolates. Gentamicin and tobramycin have similar activities against most other aerobic gram-negative rods. Against *Serratia marcescens*, gentamicin is usually more active than tobramycin.

A more controversial aspect of gentamicin and tobramycin has been toxicity. Numerous studies have addressed the relative toxicity of the two agents. More studies indicate that tobramycin is less nephrotoxic than gentamicin than the reverse. This point continues to be debated. One observer remarked: "If it takes more than ten years to prove something, there probably ain't much there to prove!"

Gentamicin, now available generically, is clearly the less expensive of the two agents (Table 11). One might argue that the cost of consequences (i.e., greater nephrotoxicity than with gentamicin) would make tobramycin actually less expensive. This question was analyzed closely by investigators at Johns Hopkins University, who concluded that gentamicin is more cost-effective than tobramycin even when the greater incidence of nephrotoxicity with gentamicin is taken into account.[194] Investigators at Duke University came to the same conclusion: "In the absence of patient-specific *in vitro* data or unusual circumstances, gentamicin should be the aminoglycoside of choice for routine use."[195]

The issue for physicians, then, is when to choose tobramycin (or amikacin or netilmicin) rather than gentamicin. Such a decision could be based on *in vitro* susceptibility data (indicating that one of the other agents is more active than gentamicin) or on clinical findings suggestive of an especially high risk of nephrotoxicity (such as critically-ill surgical patients with changing hemodynamics).[196]

5. Amikacin

Amikacin is closely related to kanamycin; a small chemical modification bestowed the activity against *Pseudomonas aeruginosa* lacking in the parent drug.[197] MIC values tend to be similar or even slightly higher for amikacin than for gentamicin and tobramycin against mutually-susceptible microorganisms (Tables 5 and 6). However, serum levels are so much higher with amikacin (Table 7) that the usual inhibitory quotients are much higher. Thus, the primary advantages of amikacin over gentamicin and tobramycin are pharmacokinetic. Resulting in high, predictable serum levels, and being easily adapted to an every 12 hour dosing schedule, a case can be made that amikacin should be the preferred aminoglycoside antibiotic.[198]

Another fine point in favor of amikacin use concerns inactivation of aminoglycosides by the various antipseudomonal penicillins. This effect can assume *in vivo* significance especially in patients with renal failure; that is, high serum levels of antipseudomonal penicillins (such as ticarcillin) can actually cause inactivation of aminoglycosides. Amikacin has been reported to be inactivated by the antipseudomonal penicillins to a lesser extent than tobramycin and gentamicin.[199] A disadvantage of amikacin may be that its ototoxicity, like that of kanamycin, tends to be cochlear rather than vestibular and may be relatively great (Table 22).

Compared to the other available aminoglycosides, amikacin is inactivated by fewer drug-inactivating enzymes produced by resistant hospital-associated microorganisms. This observation makes amikacin invaluable for selected patients.[200] This observation also led to an early conclusion by many physicians that amikacin should be "kept on the shelf in reserve" for therapy of infections due to gentamicin- and tobramycin-resistant bacteria. Re-evaluations challenge the validity of this philosophy, since

TABLE 22. INCIDENCE OF NEPHROTOXICITY AND OTOTOXICITY FROM AMINOGLYCOSIDES--- RESULTS OF PUBLISHED TRIALS INVOLVING APPROXIMATELY 10,000 PATIENTS*

Agent	Nephrotoxicity	Cochlear toxicity**
Gentamicin	14.0 %	8.3 %
Tobramycin	12.9	6.1
Amikacin	9.4	13.9
Netilmicin	8.7	2.4

*From Kahlmeter G, Dahlager JI, J Antimicrob Chemother 13 (Suppl A): 9-22, 1984.

**Fewer data were available for vestibular toxicity, which ranged from 3.2 to 3.7 percent for gentamicin, tobramycin, and amikacin and which was 1.4 percent for netilmicin.

most experience has been that resistance to amikacin emerges slowly if at all.[201, 202] However, in one recent experience, heavy use of amikacin for suspected sepsis led to a rapid, significant rise in the percentage of gram-negative isolates, including blood isolates, which were amikacin-resistant.[203]

6. Netilmicin

Netilmicin is a recently-introduced aminoglycoside with activity similar to that of tobramycin and gentamicin. Its primary advantage consists of lower nephrotoxicity and ototoxicity. This appears to be the case in animal studies and is arguably the case in human trials (Table 22). Lerner et al. found that netilmicin caused hearing loss in only three percent of treated patients compared to 12 percent of patients treated with tobramycin.[204] If verified, this finding would constitute a strong case for netilmicin as the aminoglycoside of choice in patients whose baseline audiograms disclose high-frequency hearing deficits. A second potential advantage of netilmicin is that less-frequent dosing schedules (e.g., 200 mg every 12 hours) seem to be effective. This permits less frequent, intramuscular administrations — with the potential for decreased administration costs and less need for monitoring of serum levels.

7. Cost Comparisons

In the preceding discussions, we have concluded that gentamicin remains the least expensive of the commonly-used parenteral aminoglycosides, and that this is the case even after taking into account its slightly greater toxicity (compared to tobramycin). In other words, this conclusion is based on acquisition costs and cost of consequences (Section II). However, determinations of "how much drug one buys for the money" provide a different perspective (Table 23).

In Table 23, we have determined the "daily kill per dollar" using the formula derived in Section IV. The quotients shown in Table 23 should not be cast in stone, since they are especially dependent upon somewhat arbitrarily-selected MIC-90 values (from Table 5 and 6). However, use of these data suggests the following:

(1) Amikacin, despite its higher acquisition cost, compares reasonably well with gentamicin in terms of "daily kill per dollar." This finding re-

TABLE 23. COST-EFFECTIVENESS OF FOUR AMINOGLYCOSIDES AGAINST VARIOUS GRAM-NEGATIVE RODS, MEASURED AS "DAILY KILL PER DOLLAR"*

Microorganisms	Gentamicin	Tobramycin	Amikacin	Netilmicin
E. coli	0.06	0.04	0.07	0.10
Klebsiella pneumoniae	0.07	0.04	0.06	0.10
Proteus mirabilis	0.07	0.05	0.03	0.05
Enterobacter aerogenes	0.07	0.04	0.05	0.10
Serratia marcescens	0.05	0.02	0.04	0.03
Pseudomonas aeruginosa	0.02	0.04	0.02	0.01
Acinetobacter calcoaceticus	0.03	0.02	0.04	0.02

*Calculations based on the formula (from section IV),

$$\text{"daily kill per dollar"} = \frac{\text{peak serum level / MIC-90}}{\text{cost per day}}$$

using peak serum levels from Table 7, MIC-90 values from Tables 5 and 6, and daily costs from Table 11.

flects the much higher serum levels obtained with amikacin therapy compared to gentamicin therapy.

(2) Tobramycin provides the least "daily kill per dollar" against common pathogens such as *E. coli* and *K. pneumoniae*, but is the best buy against *Pseudomonas aeruginosa*.

(3) Netilmicin, when given as 200 mg every 12 hours, provides the most "daily kill per dollar" against *E. coli*, *K. pneumoniae*, and *Enterobacter* aerogenes. Use of intramuscular (rather than intravenous) netilmicin would make netilmicin even more cost-effective.

(4) In terms of "daily kill per dollar," all of these agents are relatively expensive compared to the beta-lactam agents (as we shall see subsequently in Section IX).

B. THE GLYCOPEPTIDE ANTIBIOTICS — VANCOMYCIN AND TEICOPLANIN

1. *A Promising Future?*

Vancomycin was isolated from a strain of *Streptomyces orientalis* isolated, in turn, from soil obtained from a jungle path in Borneo. At its introduction in 1956, this agent appeared to answer the challenge posed by penicillin-producing staphylococci. However, production of vancomycin proved to be difficult. Early preparations of vancomycin, now affectionately remembered as "Mississippi mud vancomycin," contained as much as 20 percent of an unknown substance which no doubt contributed to the preparation's toxicity. Methicillin was introduced shortly thereafter, and vancomycin became a largely forgotten drug — and the only agent of its class.

New therapeutic problems give vancomycin an important niche in today's hospital formulary. To keep this niche, vancomycin may face a stiff challenge from a new agent, teicoplanin. A new method for screening crude broths, based on the affinity of glycopeptide antibiotics for certain peptide precursors in the bacterial cell wall,[205] raises the likelihood that we may soon see a host of new agents being tested in search of an ideal drug with high activity, favorable pharmacokinetics, and low toxicity.

2. *Vancomycin*

With a single unimportant exception (*Flavobacterium meningosepticum*), vancomycin has no activity against gram-negative bacteria, nor does it have activity against mycobacteria, fungi, or *Bacteroides fragilis*. However, vancomycin is consistently active against virtually all gram-positive microorganisms. The emergence of methicillin-resistant staphylococci as a major problem in large medical centers in the United States has caused a palpable resurgence of interest and clinical use in vancomycin. It is apt to say that vancomycin has been "born again."[206, 207]

Vancomycin is expensive (Table 11). The issues in cost effective use revolve mainly around its indications as the drug of choice. In many medical centers, use of vancomycin for methicillin-resistant *S. aureus* infection has spawned the impression among young physicians that vancomycin is the "best" antistaphylococcal antibiotic. Although vancomycin is in fact a bactericidal agent, we know of no evidence to indicate that it is superior to other drugs such as nafcillin or cefazolin against mutually-susceptible microorganisms. Failure of vancomycin in staphylococcal endocarditis has been reported.[208]

A brief word about vancomycin pharmacology and toxicity is in order. Elimination is almost entirely renal; indeed, in patients undergoing hemodialysis a single one gram dose may give therapeutic blood levels for up to two weeks. Thus, the need to reduce the dose of vancomycin in patients with renal impairment may be even more critical than is the case with aminoglycosides. The nomogram given here (Figure 6) or nomograms designed specifically for vancomycin[209, 210] may be used for this purpose. Another method is to give a loading dose of 15 mg/kg to adults followed by a daily parenteral dose (divided, as may be appropriate, into two or more doses) of 150 mg plus (15 X the creatinine clearance in ml/min) mg.

Like the aminoglycosides, vancomycin has both nephrotoxicity and ototoxicity. With the newer preparations, nephrotoxicity may be much less than was previously thought to be the case. The incidence of ototoxicity appears to be low but is largely undefined. There may be synergistic nephrotoxicity and ototoxicity when aminoglycosides are given concomitantly. Monitoring of vancomycin serum concentrations with the aim of keeping peak blood levels between 20 and 50 mcg/ml and trough levels below 10 mcg/ml is desirable especially in persons with impaired renal function or baseline hearing impairment. Un-

fortunately, most hospitals are not equipped to provide prompt vancomycin serum levels.

Vancomycin is best given as a slow intravenous infusion over one hour. Given more rapidly, a pseudoallergic "red neck" syndrome may be observed. In a retrospective view of 100 courses of vancomycin it was observed that 13 percent of patients had thrombphlebitis related to administration, five percent had fever, and five percent had reversible impairment of renal function; ototoxicity was not observed.[211]

In summary, vancomycin is an invaluable part of our antibiotic armamentarium, but at the present time is usually not a cost-effective drug of first choice unless clinical evidence strongly suggests specific syndromes such as methicillin-resistant *S. aureus* infection, penicillin G-resistant pneumococcal disease (rare!), *Clostridium difficile* colitis, or endocarditis due to staphylococci or enterococci in patients with penicillin allergy.

3. *Teicoplanin*

Teicoplanin (formerly teichomycin) is a new agent derived from *Actinoplanes teichomyceticus*.[212, 213] Teichoplanin appears to be twofold more active than vancomycin against many staphylococcal isolates, can apparently be given to patients allergic to vancomycin, and has been therapeutically effective in septicemia and endocarditis due to methicillin-resistant *S. aureus*.[214, 215]

Unlike vancomycin, teicoplanin can be given intramuscularly with relatively little pain or discomfort. In addition, teicoplanin has the advantage of an extremely long serum half-life — 24 to 40 hours in persons with normal renal function.[216] Assuming that the eventual acquisition cost of teicoplanin resembles that of vancomycin, we can predict that teicoplanin may become a major component of any cost-effective formulary.

C. ERYTHROMYCIN

Available since 1952, erythromycin has a long and proven track record for therapy of mild to moderately severe infections encountered in ambulatory practice. Although it occasionally causes significant side effects (especially the hepatic effects associated with the estolate preparation), its relative lack of both toxicity and allergenicity have made it a favorite for outpatient therapy.[217, 218] Gastrointestinal side effects are the most frequently-encountered limiting factor to the use of oral erythromycin therapy. Phlebitis, tending to occur early and to be severe, is an important limiting factor to the use of intravenous erythromycin. Reversible hearing loss, mainly in elderly persons with underlying hepatic or renal disease, occurs occasionally.[219]

Three new indications for erythromycin add to its importance. Foremost is its emergence as the drug of choice against *Legionella pneumophila*, an important consideration in life-threatening, undiagnosed pneumonias. Erythromycin is one of the few antibiotics with good penetration into phagocytic cells (which is very helpful against intracellular pathogens such as *Legionella*). Other emerging indications for erythromycin as a drug of first choice include *Mycoplasma pneumoniae* pneumonia, severe infections due to *Chlamydia trachomatis*, and *Campylobacter fetus* ssp. *jejuni* enteritis.

Some new oral derivatives of erythromycin with especially long serum half-lives are likely to have an impact on cost-effective outpatient use of this agent. The central issue with regard to cost-effective erythromycin therapy for hospitalized patients concerns when to use the much more expensive intravenous preparations (Tables 11 and 12). Peak blood levels after 500 mg intravenously are up to five times greater than following oral administration of the base, stearate, estolate, or ethylsuccinate preparations. It makes sense to give the intravenous preparation to seriously ill patients. However, the question, "how much is enough?", has not been extensively studied with this drug.

D. CLINDAMYCIN

Clindamycin, a derivative of lincomycin, has stood the test of time as a valuable drug against anaerobic infections. The discoveries that clindamycin-related colitis is due to a specific pathogen (*Clostridium difficile*) and is treatable have lessened the aura of fear surrounding this drug. Although many clinicians think of clindamycin primarily as a drug of choice against *Bacteroides fragilis*, it is useful to recall its excellent antistaphylococcal activity as well. Clindamycin is in fact active against most gram-positive bacteria (exceptions include the enterococci) and has moderate activity against a few gram-negative bacteria as well.[220] The ability of clindamycin to penetrate into bone and soft tissue surpasses that of nearly all other antibiotics.

Two observations might improve the cost-effectiveness of intravenous clindamycin. First, its pharmacology makes dosing every eight hours, rather than the usual every six hours, both feasible and cost-effective. In patients with jaundice and liver disease, the every eight hour schedule should be used in order to avoid excessive accumulation of clindamycin.[221] Second, the compatibility of clindamycin with many other antibiotics including the aminoglycosides allows the same adminstration set to be used for combination therapy — a definite cost-saving strategy.

E. TETRACYCLINES

Oral tetracycline, available generically, is clearly a bargain (Table 12). We should mention that concern has been expressed from time to time that the bioavailability of generic tetracycline may be considerably less than that of tetracycline carrying specific brand names.[222] We should also mention that the extra cost of doxycyline may be worthwhile for patients with impaired renal function, since tetracyclines other than doxycycline will predictably cause further elevation of the blood urea nitrogen and may occasionally cause irreversible worsening of renal function. Renal failure due to doxycycline has been reported, but is quite rare.

For intravenous use, most observers prefer doxycycline to the other preparations. This may be due in part to vein irritation and in part due to fear of renal and/or hepatic toxicity from intravenous tetracycline in full doses. The price of intravenous doxycycline is, in general, similar to that of most therapeutic alternatives (Table 11).

The major indications for the tetracyclines have changed but little in recent years, and no attempt will be made here to review these indications. The caveat that tetracycline should not be administered to children under age eight is worth repeating, especially in view of the Tennessee study demonstrating that some physicians (mainly family practitioners and internists rather than pediatricians!) did not seem to appreciate its toxicity in this age group.[223]

F. CHLORAMPHENICOL AND THIAMPHENICOL

Similarly, oral chloramphenicol is a bargain (Table 13). Were it not for the occasional occurrence of aplastic anemia, chloramphenicol would obviously continue to rank among the most commonly-prescribed antibiotics.

A decade ago, the statement was issued that aplastic anemia had not occurred when chloramphenicol was given only by the parenteral route.[224] This statement no longer appears to be true. A number of cases of aplastic anemia following parenteral and even topical chloramphenicol therapy have now been reported.[225] Although some of these cases may be arguable, it is clear that the parenteral preparation should also be regarded with caution.[226]

Monitoring costs may be especially high with chloramphenicol, due to the recommendation that the complete blood count and differential, and also (according to some investigators) reticulocyte counts and serum iron determinations, be measured at frequent intervals. It is recommended that chloramphenicol be stopped if the white count falls below 2,500 per cmm, the percentage of polymorphonuclear leukocytes falls below 40 percent, or the platelet count falls below 100,000 per ml. Anemia, increasing serum iron, and falling reticulocyte counts do not necessarily call for discontinuing chloramphenicol, although it may be prudent to decrease the dose.[227] Chloramphenicol continues to have relatively few indications. The advent of metronidazole has decreased the necessity to use chloramphenicol routinely for anaerobic infections of the central nervous system. Physicians should also be aware of the potential for *in vivo* antagonism when chloramphenicol and bactericidal, cell wall-active antibiotics are used in combination.

Thiamphenicol is a compound extremely similar to chloramphenicol. Its spectrum of activity and clinical usefulness are also similar. Used extensively throughout Europe and Africa, thiamphenicol is said to have been used in more than 50 million patients since 1972 without a single case of aplastic anemia.

If this observation is "believable" and if all other aspects seem similar, then thiamphenicol should obviously replace chloramphenicol for clinical use. A recently-described molecular basis for this observation adds to its credibility. It appears that a short-lived reduction intermediate of chloramphenicol directly damages DNA, whereas thiamphenicol causes no such effects.[228] We can anticipate that thiamphenicol will eventually become a part of the drug formulary in American hospitals as well.

G. METRONIDAZOLE

Dr. Sydney Finegold deserves our collective gratitude for discovering that metronidazole (Flagyl), introduced in 1959 for therapy of *Trichomonas* vaginitis, has excellent activity against almost all of the strict anaerobic bacteria. Most clinical isolates are inhibited by concentrations of 4 mcg/ml or less. Activity is especially great against anaerobic gram-negative rods, including *Bacteroides fragilis*. Recent data indicate that all anaerobic gram-negative rods are inhibited by 16 mcg/ml or less (the break point recognized by the Food and Drug Administration). About two percent of anaerobic gram-positive cocci, one percent of *Clostridia*, and 38 percent of non-sporeforming gram-positive rods are resistant to 16 mcg/ml;[229] these latter isolates are usually of much less clinical importance.

These favorable MIC values tell only part of the story. In contrast to most alternative drugs for *Bacteroides fragilis* infections, metronidazole is powerfully bactericidal. After exposure of *B. fragilis* cells to metronidazole, DNA synthesis comes to an abrupt halt. Current thought holds that this is due to an effect on the multi-enzyme replication complex necessary for DNA synthesis. Within an hour, protein and RNA synthesis also come to a halt. For all intents and purposes, the cell is dead.[230]

The clinical pharmacology of metronidazole is equally favorable. As we reviewed earlier (Section III), absorption from the gastrointestinal tract is excellent. Food delays the appearance of peak serum levels but does not significantly impair overall absorption. In one recent study, patients who were receiving intravenous metronidazole after gastrointestinal surgery were changed over to oral therapy; surprisingly, overall serum activity increased 51 percent.[231] Rectal suppositories provide a bioavailability of 80 percent and, although not yet available in the United States, are thus another promising mode of therapy.[232] Since either oral or rectal administration leads to excellent bioavailability, the question can be asked whether intravenous therapy is indeed necessary. Penetration into body fluids is excellent. This includes the cerebrospinal fluid, making metronidazole a drug of choice for therapy of brain abscess and for the rare problem of anaerobic meningitis.

Major adverse reactions from metronidazole are rare. These include encephalopathies and seizures, cerebellar dysfunction, peripheral neuropathy, a disulfiram (Antabuse) reaction with alcohol, pseudomembranous colitis (paradoxical, since metronidazole is effective therapy against *Clostridium difficile* colitis), and potentiation of the effects of warfarin (Coumadin). Minor gastrointestinal upsets are common. A single case of metronidazole-induced pancreatitis was reported recently.[233] The major reservation about metronidazole has been its potential for teratogenicity. This appears to have been observed in animal models by one laboratory but has not been confirmed by others. Thousands of pregnant women have now received metronidazole without a single clear-cut instance of teratogenicity. Nevertheless, it seems prudent to avoid the use of the drug during pregnancy, and especially during the first trimester.[229] This reservation is unfortunate, since metronidazole should be an especially cost-effective agent for therapy of pelvic inflammatory disease.

H. TRIMETHOPRIM-SULFAMETHOXAZOLE (TMP/SMX)

Parenteral preparations of this combination are now widely available. However, absorption after oral administration is excellent; TMP/SMX is the third orally-administered drug which we considered an excellent "drug for the money" (Table 13). The two components of this combination exhibit striking synergism against many pathogens.[234] Favorable pharmacokinetics include diffusion into most body fluids and tissues. Recent studies indicate good penetration into the cerebrospinal fluid, making the combination useful for selected cases of meningitis.[235-237] The oral route has been used to treat even the most serious infections (such as *Pneumocystis carinii* pneumonia).

TMP/SMX is the only orally-available antibiotic other than chloramphenicol with a truly broad spectrum of activity against gram-negative pathogens. In addition, TMP/SMX has broad activity against aerobic gram-positive cocci. Enterococci (apparently inhibited *in vitro* but not *in vivo*) and *Pseudomonas aeruginosa* are the major "holes" in its aerobic coverage. Thus, while known primarily as an agent for urinary tract infection, TMP/SMX has many other areas of potential usefulness. Issues in cost-effectiveness may determine its eventual role in many of these areas.

I. RIFAMPIN

Known primarily as an anti-tuberculous drug, rifampin has slowly but perceptibly acquired a place in anti-bacterial therapy. Its virtues include (1) good pharmacokinetics with excellent penetration not only into body fluids and tissues but also into phagocytic cells and (2) a broad range of activity against gram-positive and gram-negative microorganisms. Its principal drawback is that bacteria rapidly acquire resistance.[238] Other concerns include drug-induced hepatitis and unusual allergic reactions. Rifampin has become the drug of choice for prophylaxis against both meningococcal and *H. influenzae* disease. It seems to have a place, on an individualized basis, as a synergistic agent in staphylococcal infections. Physicians should realize, however, that rifampin has the ability for antagonism as well as synergism in many of these settings. Further, use of rifampin in combination with other agents, including vancomycin, does not assure that resistance will not develop.[239, 240] Resistance to rifampin is especially troublesome not only because it can develop rapidly[240] but also because few laboratories carry out sensitivity testing with this agent. Wide use of rifampin would predictably lead to widespread resistance, and therefore rifampin cannot be broadly endorsed as an agent for cost-effective therapy.

J. THE OXYQUINOLONES — DNA GYRASE INHIBITORS

The most dramatic development on the horizon of antibiotic therapy may well be the emergence of a new family of oxyquinolones. These agents are structurally related to nalidixic acid (NegGram), marketed as a urinary antimicrobic. The target enzyme for these compounds appears to be DNA gyrase. A list of the DNA gyrase inhibitors is shown in Table 24.

The newer oxyquinolones have exceptionally broad activity against most gram-negative bacteria (Table 25).[241, 242] In one study, MIC-90 values against all enteric pathogens studied with the exception of *Campylobacter* were equal to or less than 0.097 mcg/ml. They are highly active against methicillin-resistant *S. aureus* with a MIC-90 as low as 1.0 mcg/ml.[243] Although none of the quinolones are extremely active against anaerobic pathogens, ciprofloxacin (Figure 13) may be the most promising agent in this regard.[244, 245] In one study, the MIC-90 for *Bacteroides fragilis* isolates from community hospitals was 4 mcg/ml.[244] Ciprofloxacin has been used successfully for therapy of infections due to *Pseudomonas aeruginosa*.[246] Like aztreonam, it may prove to be useful for selective decontamination of the gut in neutropenic cancer patients.[247]

Tempering enthusiasm for the oxyquinolones has been the low serum levels after oral administration of many of these drugs. This is being countered by the development of intravenous

(Continued on page 177)

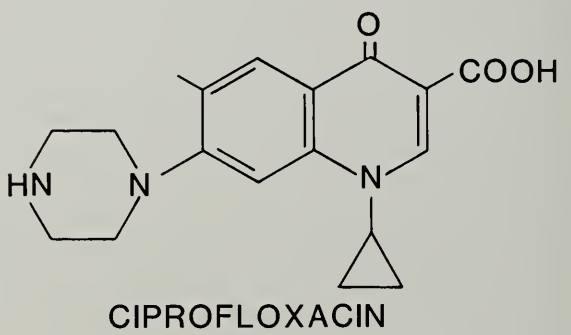
TABLE 24. THE DNA GYRASE INHIBITORS

Nalidixic acid	Enoxacin
Cinoxacin	Pefloxacin
Pipemidic acid	Norfloxacin
Fulmequine	Ofloxacin
Oxolinic acid	Ciprofloxacin

TABLE 25. GENERAL PATTERNS OF BACTERIAL SUSCEPTIBILITIES TO THE NEW OXYQUINOLONES

I. Especially susceptible	
Common Enterobacteriaceae	Salmonella species
H. influenzae	Shigella species
N. meningitidis	Yersinia enterocolitica
N. gonorrhoeae	Vibrio species
Branhamella catarrhalis	Aeromonas hydrophila
Pasterurella multocida	
II. Somewhat less susceptible	
Pseudomonas aeruginosa	Staphylococci
Acinetobacter calcoaceticus	Listeria monocytogenes
Streptococci including enterococci	
III. Typically resistant	
Anaerobic bacteria including B. fragilis*	

*Of these agents, ciprofloxacin appears to be especially promising against anaerobic as well as aerobic microorganisms.



CIPROFLOXACIN

FIGURE 13. Ciprofloxacin, a new oxyquinolone derivative, possesses remarkable activity against most gram-negative microorganisms (see text).

SCMA NEWSLETTER

March, 1986

SCMA ANNUAL MEETING UPDATE: APRIL 23 - 27, CHARLESTON, SC

As this "*Newsletter*" goes to press, there are 110 pre-registrants for the 138th Annual Meeting of the South Carolina Medical Association. The meeting will be held at the Sheraton Charleston Hotel, April 23 - 27. If you have not yet sent in your registration form to SCMA Headquarters, please do so today. On-site registration will be assisted by computer equipment, but pre-registration greatly speeds up the registration process. Reservations at the Sheraton should be made direct.

On February 7, *J. Gavin Appleby, M. D.*, announced that he will complete his term as SCMA President at the Annual Meeting. Dr. Appleby has been filling the unexpired term of the late *Leonard W. Douglas, M. D.* Included in the list of elections to be held, therefore, will be the office of President-Elect.

New this year will be the presentation of the Governor's Worksite Health Promotion Award, co-sponsored by the SCMA and the Governor's Council on Physical Fitness. The award was developed to promote and recognize the employers' efforts to provide on-site health education opportunities. Winners are chosen in several categories based on the number of employees at the applicant companies. The South Carolina Medical Association Award for Excellence in Health Promotion will be given to the corporation with the most outstanding program.

Judges, including *Stephen C. Lloyd, M. D.*, representing the SCMA, will review a company's philosophy of health promotion; policies which further health promotion; resources committed to the program components (such as nutrition education, high blood pressure control, etc); program evaluation; level of employee participation and program results. Applications are currently being accepted.

With regard to general scientific sessions and workshops, Continuing Medical Education Committee Chairman *Jim Long, M. D.*, has announced that the total number of CME credits involved is 55. Any one physician can attend as many as 22 hours to obtain credits.

The April, 1986 issue of *The Journal of the South Carolina Medical Association* will be devoted to the Annual Meeting and will contain an updated "Schedule of Events," news of special guests, and those reports and Resolutions which are available at publication deadline.

PLAN TO ATTEND THE 138TH ANNUAL MEETING AND PRE-REGISTER TODAY!

MEDICARE REIMBURSEMENT REDUCED

President Regan's sequestration order under Gramm-Rudman provisions went into effect on March 1, 1986, since Congress and the Administration failed to agree on any alternative methods for reducing fiscal year 1986 expenditures.

Under this order, ALL Medicare program expenditures automatically must be reduced by one percent through September 30, the end of the fiscal year.

For ALL physician services rendered under Medicare starting March 1, federal reimbursement will be reduced one percent for each bill submitted.

RESEARCH ON DOMESTIC VIOLENCE

The University of South Carolina research team on domestic violence is beginning to conduct telephone interviews with women in South Carolina who have experienced physical abuse. The purpose of this study is to collect information that may help in understanding patterns of physical abuse. From this knowledge, the research team hopes to identify strategies which are effective in decreasing abuse in relationships.

The research team is interested in interviewing women who have been in an abusive relationship over a period of time (whether or not the abuse has stopped), and women who have experienced only one or two incidents of abuse for at least two years. All information will be handled confidentially and anonymously. *If you have patients who fit into either of these categories who are willing to participate, they should call 777-4864 or write to the Abuse Project, 1819 Pendleton St., Columbia 29208. A small stipend is granted to participants.*

ON THE LEGISLATIVE FRONT...

S.157, Section 44-7-70: Reporting Disciplinary Actions to Medical Examining Board: On February 20, 1986, Governor Richard W. Riley signed into law the above Bill which now requires most final disciplinary actions to be reported to the Medical Examining Board by the medical staff chief or medical director of every health care facility, as defined in Section 44-7-130. Actions to be reported include the results of, and the circumstances concerning, any action resulting in the revocation or suspension of, or other limitation upon, a physician's privileges to practice in that health care facility. Such a report is NOT required in the case of (1) a nondisciplinary resignation by the physician; however, any resignation occurring after an incident or occurrence which could result in the revocation or suspension of, or other limitation upon, the physician's privileges must be reported; (2) a minor disciplinary action regarding the physician's privileges in that health care facility when the action taken does not involve the revocation or suspension of, or other limitation upon, the physician's privileges to practice there; (3) a disciplinary action resulting from the physician's failure to meet record-keeping standards; (4) a disciplinary action resulting from the physician's failure to attend meetings; or (5) other disciplinary actions as defined by regulation promulgated by the State Board of Medical Examiners.

Any person making the report required by this section is immune from criminal and civil liability in making the report, if the report is made in good faith and without malice.

ON THE LEGISLATIVE FRONT..... *(See current "Legislative Update" for more details)*

Tort Reform Activity: On Tuesday, February 25, 1986, the full Senate Judiciary Committee held a public hearing on S. 895, medical malpractice legislation. Speaking in support of S. 895 were J. Gavin Appleby, M. D., Waitus O. Tanner, M. D., Vincent Degenhart, M. D., Thomas C. Rowland, Jr., M. D., and Walter J. Roberts, Jr., M. D. The medical community was well represented at the hearing, with approximately 200 physicians and Auxilians present.

Special recognition should be given to the physicians from Aiken County who brought two bus loads of concerned citizens to the hearing. The next consideration of the bill will be given on March 11 at 3:00 p.m. in Senate Judiciary. It is essential that your Senator hear from you on your support of S.895.

The Living Will: The South Carolina General Assembly approved H.2041, the Living Will, on Wednesday, February 26. The bill is now awaiting the signature of Governor Richard W. Riley.

H. 2041 provides that an individual may make a provision in his or her will to withhold or withdraw life sustaining procedures in the event of a terminal condition. The SCMA actively supported passage of this legislation. Much credit and thanks are due to *Representative Harriet Keyserling, Senator John Hayes, and Ms. Keller Bannon* for their commitment to the passage of H. 2041.

The bill provides the form for the declaration of intent, and this is reprinted below for your information.

STATE OF SOUTH CAROLINA DECLARATION OF A DESIRE FOR A NATURAL DEATH
COUNTY OF _____

I, _____, a resident of and domiciled in the City of _____, State of South Carolina, make this Declaration this _____ day of _____, 19_____.

I wilfully and voluntarily make known my desire that no life-sustaining procedures be used to prolong my dying if my condition is terminal, and I do hereby declare:

If at any time I have an incurable injury, disease, or illness certified to be a terminal condition by two physicians who have personally examined me, one of whom is my attending physician, and the physicians have determined that my death will occur without the use of life-sustaining procedures and where the application of life-sustaining procedures would serve only to prolong the dying process, I direct that such procedures be withheld or withdrawn, and that I be permitted to die naturally with only the administration of medication or the performance of any medical procedure necessary to provide me with comfort care.

In the absence of my ability to give directions regarding the use of such life-sustaining procedures, it is my intention that this Declaration be honored by my family and physicians as the final expression of my legal right to refuse medical or surgical treatment and I accept the consequences from such refusal.

I am aware that this Declaration authorizes a physician to withhold or withdraw life-sustaining procedures. I am emotionally and mentally competent to make this Declaration.

THIS DECLARATION MAY BE REVOKED BY THE DECLARANT, WITH REGARD TO HIS PHYSICAL OR MENTAL CONDITION.

(1) BY BEING DEFACED, TORN, OBLITERATED, OR OTHERWISE DESTROYED BY THE DECLARANT OR BY SOME PERSON IN THE PRESENCE OF AND BY THE DIRECTION OF THE

DECLARANT.

(2) BY A WRITTEN REVOCATION SIGNED AND DATED BY THE DECLARANT EXPRESSING HIS OR HER INTENT TO REVOKE. THE REVOCATION SHALL BECOME EFFECTIVE ONLY UPON COMMUNICATION TO THE ATTENDING PHYSICIAN BY THE DECLARANT OR BY A PERSON ACTING ON BEHALF OF THE DECLARANT. THE ATTENDING PHYSICIAN SHALL RECORD IN THE PATIENT'S MEDICAL RECORD THE TIME AND DATE WHEN HE RECEIVED NOTIFICATION OF THE WRITTEN REVOCATION.

(3) BY A VERBAL EXPRESSION BY THE DECLARANT OF HIS INTENT TO REVOKE THE DECLARATION. THE REVOCATION SHALL BECOME EFFECTIVE ONLY UPON COMMUNICATION TO THE ATTENDING PHYSICIAN BY THE DECLARANT. THE ATTENDING PHYSICIAN SHALL RECORD IN THE PATIENT'S MEDICAL RECORD THE TIME, DATE, AND PLACE OF THE REVOCATION AND THE TIME, DATE, AND PLACE, IF DIFFERENT, OF WHEN HE RECEIVED NOTIFICATION OF THE REVOCATION.

_____
Declarant

AFFIDAVIT

STATE OF _____ COUNTY OF _____

We, _____, _____, and _____, the witnesses whose names are signed to the foregoing Declaration, dated the _____ day of _____, 19____, being first duly sworn, do hereby declare to the undersigned authority that the Declaration was on that date signed by the said declarant as and for his DECLARATION OF A DESIRE FOR A NATURAL DEATH in our presence and we, at his request and in his presence, and in the presence of each other, did thereunto subscribe our names as witnesses on that date. The declarant is personally known to us and we believe him to be of sound mind. None of us is disqualified as a witness to this Declaration by any provision of the South Carolina Death With Dignity Act. None of us is related to the declarant by blood or marriage; nor directly financially responsible for the declarant's medical care; nor entitled to any portion of the declarant's estate upon his decease, whether under any will or as an heir by intestate succession; nor the beneficiary of a life insurance policy of the declarant; nor the declarant's attending physician; nor an employee of such attending physician; nor a person who has a claim against the declarant's decedent's estate as of this time. No more than one of us is an employee of a health facility in which the declarant is a patient. If the declarant is a patient in a hospital or skilled or intermediate care nursing facility at the date of execution of this Declaration at least one of us is an ombudsman designated by the State Ombudsman, Office of the Governor.

Witness_____
Witness_____
Witness_____

Subscribed, sworn to and acknowledged before me by _____, the declarant, and subscribed and sworn to before me by _____, _____, and _____, the witnesses, this _____ day of _____, 19_____.

_____
Notary Public for
My commission expires:_____/
SEAL

The declaration must be signed by the declarant in the presence of three witnesses and shall be attested and subscribed in the presence of the declarant and of each other by the three witnesses and an officer authorized to administer oaths under the laws of the State where acknowledgement occurs or else the declaration shall be utterly void and of no effect. Each will prepared in accordance with the provisions of this section shall set forth the procedure and requirements for revocation of the declaration. Requirements for revocation shall be set forth in bold-face print.

preparations. Many observers speculate that the competition among the quinolones will be, a few years hence, as keen as the current competition among the beta-lactam agents. Whether resistance will develop with wide usage remains to be determined. Newer quinolone derivatives seem to select resistant mutants much less often than do the older quinolones derivatives such as nalidixic acid. However, heavy usage of pefloxacin in an intensive care unit in Paris led to a marked increase in resistance among nosocomial pathogens.[248]

K. SUMMARY

In this and the previous section, we have attempted a brief overview of current developments in antimicrobial therapy. To an increasing extent, cost-effectiveness will be one benchmark by which the new agents are measured against the older ones. In the next three sections, we shall attempt to place both the old and the new compounds in clinical perspective for the three areas of antimicrobial usage: preventive therapy, presumptive therapy, and precise therapy.

VII. PREVENTIVE ANTIMICROBIAL THERAPY

A. POLICIES PAY OFF

Of the three areas of antimicrobial therapy (preventive, presumptive, and precise), preventive or prophylactic therapy offers the most readily-available opportunities for cost containment. This is the case because the cost of preventive therapy can be determined by set, standardized protocols. Members of a hospital staff, working with the hospital's pharmacy, may decide for themselves the most cost-effective preventive therapy for a given procedure. There are many published guidelines to facilitate such decisions, and research in this area flourishes.

The implications are substantial.

Let us assume, for instance, that one moderately busy orthopedic surgeon performs five operations calling for preventive antibiotic therapy each week, and operates 48 weeks out of each year. By using a standard cefazolin regimen instead of a standard-dose cefamandole regimen, he could save his hospital (or third-party payers, or whomever!) $23,112 each year. If he chose a low-dose cefazolin regimen, which we have shown to be effective in clean orthopedic surgery,[249] he would save $30,168 (Table 26).

In this section, we shall review three categories

TABLE 26. IMPACT OF STANDARD PREVENTIVE THERAPY REGIMENS ON COST--- ILLUSTRATION FOR ONE ORTHOPEDIC SURGEON OPERATING FIVE TIMES EACH WEEK FOR 48 WEEKS OF THE YEAR*

Standard regimen	Cost per patient	Cost per year	Savings relative to regimen "A"
A. Cefamandole, 2 g IV preoperatively and then 2 g IV q6h for three days	$ 170.30	$ 40,872	------
B. Cefamandole, 2 g IV preoperatively and then 1 g IV q6h for two days	91.70	22,008	$ 18,864
C. Cefazolin, 1 g IV preoperatively and then 1 g IV q8h for three days	74.00	17,760	23,112
D. Cefazolin, 1 g IV preoperatively and then 500 mg IV q8h for two days	44.60	10,704	30,168

*Calculations based on average wholesale prices, January 1986 ($8.10 for two grams of cefamandole, $2.40 for one gram of cefazolin), and assuming an actual cost of $5.00 for each intravenous infusion.

of indications for preventive antimicrobial therapy: elective surgery, traumatic wounds, and medical conditions calling for preventive therapy.

B. ELECTIVE SURGERY

1. Principles

Prior to the introduction of antisepsis by Lister in 1867, approximately 50 percent of patients undergoing elective surgery died of postoperative infection. The impact of Listerian principles far overshadows the impact of prophylactic antibiotics.[250] Early attempts to demonstrate the efficacy of preventive drug therapy frustrated many investigators. As recently as a decade ago, it could be said that "three subjects should not be argued in polite company: religion, sex, and prophylactic antibiotics."[251]

Times have changed! At present, indications for preventive antibiotic therapy are relatively well-defined. Nearly every indication or potential indication is the subject of active, ongoing research. For instance, even the previous consensus that prophylactic antibiotics are of no value during such clean procedures as mastectomy and herniorrhaphy is being re-evaluated. In this section, we shall attempt a concise overview of the principles of cost-effective preventive therapy.

The opinion of the 1960's and early 1970's that prophylactic antibiotics were seldom, if ever, of value was based on placebo-controlled studies in which postoperative antibiotics were first given in the recovery room. The experimental demonstration by Burke and others that preventive antibiotics could be effective if the first dose was given prior to wound contamination led to further studies which showed that preventive antibiotic therapy is of definite benefit for some indications. In other situations, such as surgery involving implants, placebo-controlled trials are sometimes lacking yet antibiotics are customarily given on account of the high cost of consequences.[251-255] Although it is true that far too many investigations in this area suffer from flawed research design, the principles of preventive therapy now rest on solid ground.

It is widely held that the first dose of antibiotic must be given prior to skin incision in order to be effective. Various authorities recommend that this dose be given within 60 minutes to within four hours of skin incision. In truth, the optimum time is poorly established. It is not clear whether time must be allowed for adequate tissue levels of antibiotic (as opposed to serum levels) to be obtained. Although tissue levels have been measured in many circumstances, interpretation of these measurements is hazardous. Newer studies address the hypothesis that the first dose might be given intraoperatively, rather than preoperatively, without sacrificing efficacy.

Our current preference is to begin the first dose of antibiotic within sixty minutes of the anticipated skin incision. It is highly desirable to use a drug with a long serum half-life. For prolonged operations (e.g., exceeding four hours), a second intraoperative dose is frequently desirable unless the agent being used has extraordinarily low serum half-life (e.g., greater than six hours). Using a computer model to project intraoperative bioavailability of antibiotics, Nix et al.[256] concluded that if an agent with a short serum half-life (such as cephalothin, cephapirin, cefamandole, or cefoxitin) is to be used, the first dose should be given at the time of induction of anesthesia. Use of an agent with a longer half-life (such as cefazolin, cefonicid, ceforanide, or cefuroxime) is a definite advantage.

Use of antibiotics in surgery is a good starting point for any hospital needing to carry out reviews (as is required by the Joint Commission on Accreditation of Hospitals). It is often useful simply to analyze whether the first dose is usually given preoperatively. Another parameter to measure is whether antibiotics are continued for longer than 72 hours. Crossley et al., reviewing usage in 27 metropolitan hospitals in Minnesota, found that antibiotics were given preoperatively in only 47 percent of instances and were given for longer than 72 hours in one-third of instances.[257] Most reviews have similarly shown that the use of preventive antibiotics tends to be excessive.[258] Hospital staffs can set their own criteria and then determine whether these criteria are being met.

2. Current Costs

Duration of preventive therapy is a major and controllable component of cost (Table 27). Nearly all studies of preventive therapy have shown that a one-day regimen is as effective as a three-day regimen. In many situations, a single dose of preoperative antibiotic has been shown to suffice.

The rationale for short-course preventive therapy revolves around the so-called "six hour grace period" following intraoperative contamination

of tissues. During this period, the forces of host defense wage a tremendous battle with the contaminating microorganisms. Should the microorganisms prevail, infection becomes established. All subsequent antibiotic therapy is therapeutic, not preventive, and merely tends to postpone clinical recognition of a suppurative process.

Short-course therapy holds two other advantages in addition to cost savings. Suppression of the normal flora is minimized, thus reducing the likelihood of nosocomial infection due to the more difficult-to-treat pathogens such as *Pseudomonas*, *Acinetobacter*, *Enterobacter*, and *Serratia*. The risk of phlebitis and other complications of antibiotic therapy is reduced. Many trials will continue to test the hypothesis that therapy with a single dose of preoperative antibiotic may be as effective as therapy for one day, three days, or even longer.

Most infectious disease specialists consider cefazolin to be the standard for comparison for preventive antimicrobial therapy regimens.[259, 260] In nearly all situations in which controlled studies have been carried out with the possible exceptions of head and neck surgery and colon surgery, cefazolin has been as effective as the alternatives. Experimental studies indicate that cefazolin matches the efficacy of more expensive alter-

TABLE 27. CURRENT COSTS OF SOME PREVENTIVE THERAPY REGIMENS*

Regimen	One Day	Three Days
Cefazolin, 1 g IM q8h	$ 22.21	$ 66.63
Cefazolin, 1 g IV q8h	37.21	111.63
Cefamandole, 1 g IV q6h	46.20	138.60
Cefamandole, 2 g IV q6h	72.40	217.20
Cefoxitin, 1 g IV q6h	51.86	155.58
Cefonicid, 1 g IM q24h	15.20	45.60
Cefonicid, 1 g IV q24h	20.20	60.60
Ceforanide, 1 g IM q24h	11.15	33.45
Ceforanide, 1 g IV q24h	16.15	48.45
Crystalline penicillin G, 2.5 m.u. IV q6h	25.57	76.71
Vancomycin, 1 g IV preoperatively and then 500 mg IV q6h	127.60	304.40
Clindamycin, 600 mg IV q6h plus tobramycin, 80 mg IV q8h	107.64	322.92
Clindamycin, 600 mg IV q6h plus gentamicin, 80 mg IV q8h	99.44	298.32
Clindamycin, 600 mg IV q6h plus gentamicin, 80 mg IV q8h mixed together	65.58	196.74

*Costs take into account a single preoperative dose which, unless specified otherwise, is the same as the maintenance dose. Costs are based on average wholesale prices, January, 1986, and the assumption that the actual cost of each intravenous infusion is $5.00.

natives.[261] As reviewed previously (Table 20), advantages of cefazolin include its favorable spectrum of activity, favorable pharmacokinetics, and favorable drug acquisition costs for hospitals due to the possibility for competitive bidding. We agree with the statement that "there is no evidence that second- or third-generation cephalosporins result in postoperative infection rates lower than first-generation cephalosporins.[260]

Two new cephalosporins with relatively long serum half-lives — cefonicid and ceforanide — offer the possibility of once-daily therapy, or of therapy with but a single dose. Of these, cefonicid has the longer serum half-life and might be the preferred agent. Such agents with especially long half-lives provide greater leeway for error in the timing of the preoperative dose. This is a point of practical importance. Unless the patient is the "first scheduled case," operating room personnel can seldom inform ward personnel precisely when induction of anesthesia will take place. All other factors being equal, then, agents with especially slow elimination rates are to be desired.

As reviewed earlier (Section V), cefonicid and ceforanide are not as active as cefazolin against *S. aureus*. The extent to which this may be a clinically-relevant shortcoming has not been determined, although some comparative studies have shown therapeutic equivalence. It is our opinion that MIC values may not be as critical for preventive therapy as for documented infection, because the number of organisms contaminating a wound at the time of clean surgery is usually quite small. Therefore, considerations such as the extent of a drug's beta-lactamase susceptibility or inoculum effect may not be as important compared to the importance of these parameters when dealing with overtly infected tissues.

The opinion that cefamandole has been overused is widespread. Prophylaxis for clean surgery seldom — if ever — calls for the putative advantages of cefamandole (i.e., its enhanced spectrum of activity against a small handful of gram-negative microorganisms). Arguments are now being advanced that the third-generation cephalosporins might be more cost-effective than their predecessors for surgical prophylaxis.[262] In our opinion short-course cefazolin should continue to be standard for most of the current indications for prophylaxis until newer agents have been clearly shown to be more cost-effective.

3. *Orthopedic Surgery*

Prior to 1972, published data failed to support a role for prophylactic antibiotics prior to elective orthopedic surgery. Retrospective comparative studies suggested that use of prophylactic antibiotics had no effect on the development of postoperative wound infection.[263] Subsequently, two prospective, randomized, double-blind comparative studies indicated that either nafcillin or cephalothin reduced the incidence of wound infection following surgery for noncompound hip fracture.[264]

Current interest centers around the role of preventive antibiotics in total joint replacement. This is a difficult area to study, since infections involving organisms such as *Staphylococcus epidermidis* tend to be indolent and may not become obvious until several years after surgery. Hill et al. undertook a prospective, randomized comparison of cefazolin versus placebo in 2,097 patients undergoing elective total hip arthroplasty.[265] On long-term follow-up, they determined that cefazolin significantly reduced the infection rate (0.9 percent versus 3.3 percent, $p < 0.001$).

Due to the high cost of consequences, most orthopedic surgeons employ prophylactic antibiotics prior to implant surgery. Cefazolin is considered by several recent reviewers to be the drug of choice.[266-267] We agree.

From time to time, claims are made that this or that agent (such as cefamandole) may be superior due to better tissue (e.g. bone) penetration as determined in this or that laboratory. We share Fitzgerald's opinion that bone levels are extremely difficult to interpret (owing in part to the methodology involved), and that serum antibiotic levels are more meaningful.[268] Recently, it was determined that cefazolin provided much higher levels in hematomas during orthopedic surgery compared to cefamandole and cefoxitin.[269] As was pointed out earlier (Table 26), use of cefazolin rather than cefamandole for orthopedic surgery has tremendous cost implications.

DeBenedictis and colleagues reported that cefonicid and cefazolin were similarly effective as prophylaxis in patients undergoing total hip or knee replacement.[270] This observation is intriguing, especially if confirmed, for it raises the possibility of even more cost-effective prophylaxis in orthopedic surgery by using agents with longer serum half-lives (and perhaps using but a single dose). As noted earlier, we are somewhat con-

cerned about the higher MIC values against staphylococci for cefonicid and ceforanide compared to cefazolin.

Traditional recommendations for antibiotic prophylaxis in orthopedic surgery focus primarily on gram-positive microorganisms. For penicillin-allergic patients, vancomycin (which has, as we have seen, no gram-negative coverage) is considered to be the drug of choice. Inevitably, some infections after elective surgery are due to gram-negative pathogens. Thus far, however, no studies have demonstrated the potential value of using agents with a broader spectrum of activity.

The use of antibiotic irrigants and of novel methods for delivery of antibiotics such as impregnated cement or beads is beyond the scope of the present discussion.

4. Neurosurgery

Critical reviewers have concluded that there is little data to support the use of prophylactic antibiotics in elective neurosurgery.[271] However, the risk of infection varies considerably according to the type of procedure,[272] and this area continues to be re-evaluated.

Malis reported no postoperative wound infections among 1,732 patients undergoing clean neurosurgical procedures who received a parenteral aminoglycoside (gentamicin or tobramycin), parental vancomycin, and topical steptomycin (as an irrigating solution). Haines and Goodman, using Malis' regimen, found an 0.9 percent incidence of infection among 878 patients.[271] These latter authors concluded that the results were "suggestive" of an effect and that prospective trials should be done.

Prophylactic use of agents with antistaphylococcal activity, such as nafcillin, has been recommended for patients undergoing placement of implantable devices such as ventriculoperitoneal shunts. The results of trials have been inconclusive. Wang and colleagues recently reported the results of a prospective, randomized, placebo-controlled trial of trimethoprim-sulfamethoxazole (TMP/SMX) for patients undergoing placement of a ventriculoperitoneal shunt.[273] They were unable to demonstrate an effect of prophylactic antibiotics but concluded that the sample size might have been too small. In another study, TMP/SMX seemed to prevent early, but not late infections.[274] Vancomycin was determined to be ineffective.[275]

A current consensus would appear to be that, if prophylactic antibiotics are to be used for procedures such as elective craniotomy or shunt placement, the drug chosen should have good activity against staphylococci (both coagulase-positive and coagulase-negative) and should also be capable of crossing the blood-brain barrier. Whether use of agents with a broader-spectrum of activity would prevent postoperative gram-negative meningitis (a rare but difficult-to-treat complication) is undetermined.

5. Head and Neck Surgery

Similarly, the literature contains little or no consensus with regard to the role of prophylaxis during head and neck surgery. Fairbanks suggests the following regimens for surgery calling for prophylaxis: cefazolin, for clean cases; aminoglycosides plus antistaphylococcal penicillins, for contaminated cases; or clindamycin plus gentamicin or a third-generation cephalosporin for surgery carrying a high risk for anaerobic infection.[276]

Conte et al. concluded from their literature review that prophylactic antibiotics have been shown to be effective only in high-risk procedures such as those likely to involve entry into the airway or upper digestive tract. They recommended the use of a short course of cefazolin (500 mg preoperatively and postoperatively for a maximum of three doses).[253] In a small study, a single day of preventive therapy was shown to be as effective as two days of therapy for patients undergoing major head and neck surgery.[277] There is

Johnson et al. recently reported a comparison of four regimens.[278] Either cefazolin or the combination of gentamicin and clindamycin was used for patients undergoing head and neck surgery, and patients receiving either of these choices were divided into short course (one day) versus long course (five day) therapy groups. Patients receiving the gentamicin-clindamycin combination had a lower infection rate compared to those receiving cefazolin. Further, patients receiving long-course cefazolin seemed to do better than those who received one-day cefazolin preventive therapy. If

search for appropriately broad-spectrum regimens with minimum risk of toxicity for patients undergoing complex head and neck surgery in

which the aerodigestive tract is likely to be entered.

6. Noncardiac Thoracic Surgery

There have been five well-conducted prospective comparative trials of prophylactic antibiotics in thoracic surgery.[253, 279-281] In three of the five trials, the investigators concluded that prophylactic antibiotics were effective.

Short-term cefazolin therapy appears to be the most cost-effective choice for this setting. Again, prospective evaluations of single-dose prophylaxis with the newer long half-life cephalosporins will be of interest.

7. Cardiac Surgery

No randomized, double-blind, controlled trials have demonstrated that prophylactic antibiotics prevent infection following valve replacement. However, established custom favors the use of prophylactic antibiotics for this indication due to the high cost of consequences.

Serious wound infections currently complicate about one percent of median sternotomies at major centers.[282] Two prospective, placebo-controlled comparative trials have now shown a benefit for routine use of prophylactic antibiotics in patients undergoing coronary artery bypass surgery.[283] In addition, Platt et al., showed that patients receiving ceforanide had a lower infection rate compared to patients receiving cephalothin and pointed out that "if one assumes that cephalothin does not increase the risk of infection, then these data show that antibiotic prophylaxis prevents infection after coronary bypass surgery.[284]

We strongly agree with Conte et al. that "newer cephalosporins such as cefoxitin or cefamandole and the 'third-generation' cephalosporins have not been demonstrated to be more effective, less costly, or less toxic than cephalothin or cefazolin" for this indication.[253] The recent data of Platt et al. support the concept that cephalothin is a poor choice for prophylaxis due to its short serum half-life.[284] Although cefamandole has been widely used for this indication, cefazolin provides higher blood and tissue levels compared to cefamandole[285] and has not been shown to be less efficacious. Other agents such as cefuroxime,[286] cefonidid, or even third-generation cephalosporins[287] may be useful, but this has not been well-clarified.

Vancomycin is the current drug of choice for patients undergoing cardiopulmonary bypass surgery who are allergic to penicillins or cephalosporins. Farber et al. concluded that the conventional one gram dose of vancomycin was too low and that the optimum dose should be 15 mg/kg preoperatively followed by a second 10 mg/kg dose toward the end of bypass.[288] Again, it should be noted that vancomycin has no gram-negative coverage.

8. Peripheral Vascular Surgery

Clean peripheral vascular surgery represents still another situation in which infection rates are quite low but in which prophylactic antibiotics may be warranted due to the high cost of consequences. Two well-designed prospective trials have demonstrated the value of this practice.[253, 289]

Cefazolin again appears to be the drug of choice. Kaiser et al. showed that cefazolin was uniformly successful at preventing infection due to cefazolin-susceptible microorganisms.[290] As in cardiac surgery, occasional patients develop postoperative infection due to cefazolin-resistant microorganisms including hospital-associated Enterobacteriaceae (such as *Enterobacter* or *Serratia* species).

This latter observation leads to the question whether combining cefazolin with a short course of a third-generation agent such as ceftriaxone might be worthwhile. However, it should be noted that serious infections in these patients can arise not only from intraoperative contamination but also from postoperative infection. Patients undergoing cardiac or peripheral vascular surgery typically require postoperative respiratory support (with the risk of pneumonia) and hemodynamic monitoring (with the risk of vascular access-device infections or primary bacteremia). In either instance, bacteremia from the postoperative infection could seed the healing operative site leading to serious consequences. Use of broad spectrum prophylactic antibiotic therapy may, of course, predispose patients to postoperative infections due to even more difficult-to-treat pathogens (e.g., *Acinetobacter, Pseudomonas,* and fungi). The low overall incidence of serious infections following clean cardiovascular surgery makes this a difficult problem to resolve.

9. Obstetrics and Gynecology

Results of 13 of 17 prospective, randomized, placebo-controlled trials support the use of prophylactic antibiotics for patients undergoing cesarian section.[253, 291, 292] However, most observed infections during such trials are relatively mild and respond readily to therapy. A conservative recommendation, then, is to administer a short course (no more than three doses) of prophylactic antibiotics to high-risk patients. Although one study suggested that prophylaxis with two grams of cefoxitin was more effective than with one gram of cefazolin,[293] cefazolin would still seem to be the most cost-effective choice.

Eleven of 14 placebo-controlled, prospective trials have demonstrated the value of prophylactic antibiotics prior to vaginal hysterectomy.[253, 294, 295] A short course of prophylaxis using an older agent such as cefazolin has been recommended for premenopausal women and other patients who are at high risk of postoperative infection. Randomized comparisons indicate that cefazolin is equally effective compared to newer agents such as cefoxitin, cefotaxime, or ceftriaxone.[294, 295]

Only two of nine prospective, placebo-controlled trials have demonstrated a similar effect for abdominal hysterectomy.[253, 296] In this situation, then, the role of prophylactic antibiotics for patients not belonging to a high risk group is less clear. Again, studies indicate that cefazolin compares favorably with newer, more expensive agents.[297] It has been suggested that antibiotic irrigants at the time of surgery may be of value in this setting.[298]

10. Urology

It has been difficult to demonstrate statistically that prophylactic antibiotics reduce the incidence of infection following urologic surgery. Prospective, randomized, placebo-controlled trials are few.[253, 299] The requirement for an indwelling Foley catheter during the postoperative period is considered by many urologists to be an indication for prolongation of prophylactic therapy.

The conservative opinion of *The Medical Letter* is that prophylactic antibiotics "are not usually recommended" for patients undergoing urologic surgery who have baseline sterile urine cultures.[252] Patients with infected urine are at significant risk of intra- and postoperative bacteremia, posing risks such as septic shock and endocarditis. In patients with infected urine undergoing prostatic surgery, the risk of bacteremia is increased five-fold if antibiotics are not given. For patients with infected urine, preoperative therapy is generally considered to be indicated.[300, 301]

Several recent studies suggest a role for newer cephalosporins in urologic surgery. Nielsen et al. found that cefoxitin, compared to placebo, reduced the incidence of infection following transurethral prostatectomy in patients with preoperative sterile urine.[300] Childs et al. found that ceftriaxone significantly reduced the rate of infections compared to a placebo in 92 patients undergoing open and transurethral surgery in community hospitals.[302] These latter authors concluded that the high cost of consequences in the infected patients justifies routine prophylactic therapy.

In a survey of all hospital-acquired bacteremias of urinary tract origin in Columbia, South Carolina, during a five-year period, it was determined that not a single death due to bacteremia occurred on a urology service.[303] These data attest to the tremendous advances in urologic surgery and also — in all likelihood — to the benefits derived from routine use of prophylactic antibiotics in high-risk patients. The major issues to be addressed continue to be the duration of therapy (including the need to "cover" indwelling Foley catheters in such patients) and the choice of the most cost-effective agent.

11. Abdominal Surgery

Abdominal surgery is frequently either "clean-contaminated" (involving the entering of a bacteriologically colonized viscus) or "contaminated" (acute inflammation is encountered). A number of generalizations can be made on the basis of the numerous trials of preventive antibiotics.[253-304]

a. Gastroduodenal Surgery: At least eight randomized studies have demonstrated a beneficial effect of prophylactic antibiotics in elective gastroduodenal surgery.[253, 305] These studies have utilized cefazolin, cephaloridine, cefamandole, lincomycin, tobramycin, or a combination of penicillin, methicillin, and chloramphenicol. None of these regimens appears superior to any other.

Cefazolin appears to be the most cost-effective agent for this indication especially since anaerobic pathogens such as *Bacteroides fragilis* are unlikely to be encountered during surgery on the stomach and duodenum. Although cefamandole was recently reported to be effective by Nichols et

al,[305] we know of no rationale for preferring cefamandole for this indication.

b. Biliary Surgery: Although normal bile contains few, if any bacteria, approximately one-third of patients undergoing biliary surgery will be found to have positive cultures. *E. coli* and enterococci are the most frequently-encountered organisms, but other aerobic gram-negative and gram-positive pathogens are encountered. Anaerobic bacteria are sometimes encountered, but preoperative use of drugs with activity against anaerobic pathogens, such as metronidazole, have not shown to be of value.

Factors considered to be "high risk" for infection in biliary tract operations include age over 70, previous biliary surgery, choledocholithiasis, bile duct obstruction, jaundice, emergency surgery, and stress within the week prior to surgery.[306] These factors appear to predispose to be associated with bacterial colonization or infection of the biliary tract. There is agreement that prophylactic antibiotics should be given to patients with any of these risk factors. Results of intra-operative cultures of the biliary tract can be used as a guide to further antibiotic therapy, if necessary.

Cefazolin again appears to be the preferred agent, although other agents such as aminoglycosides (gentamicin or tobramycin) are sometimes listed as alternatives. A single preoperative dose of cefazolin is effective even in high-risk patients.[307] Cefamandole has been shown to be effective but would appear to have no real advantages over cefazolin.[308] Similarly, cefoxitin appears to offer no advantages over cefazolin.[309] Kellum et al. recently found no difference between use of a single dose of one gram of cefazolin versus a third-generation cephalosporin for this indication.[310]

c. Colon Surgery: There is wide agreement that prophylactic antibiotics are indicated for colorectal surgery. Indeed, it has been stated that placebo-controlled trials are no longer ethical.[311]

The optimum choice remains controversial. In few if any surgical situations are the recommended regimens so diverse. For example, current recommendations include any of the following: (1) three doses of cefazolin; (2) three doses of cefoxitin; (3) oral administration of neomycin and erythromycin base preoperatively; (4) oral administration of neomycin and tetracycline; (5) oral administration of neomycin and metronidazole; (6) parenteral administration of three doses of metronidazole, (7) parenteral administration of clindamycin and either gentamicin or tobramycin; and (8) regimens incorporating newer agents such as cefonicid.[253, 311, 312]

We can anticipate that further studies will help to define which of these regimens or of creative alternatives will prove to be the most cost-effective. Most authorities recommend an oral regimen (such as neomycin plus erythromycin base) for this indication, but whether the addition of a parenteral agent is worthwhile remains unsettled. In one study, the addition of cefazolin or ticarcillin to the oral regimen seemed to reduce infectious complications, whereas in another study the addition of cephalothin did not. Norwegian investigators recently reported the efficacy of a single preoperative dose of antimicrobial agents effective against both anaerobic and aerobic bowel flora.[313]

C. TRAUMA

1. Principles

Strictly speaking, administration of antibiotics to trauma victims is therapeutic rather than prophylactic. Since trauma is usually an unpredictable event, it is not possible to administer antibiotics before tissue contamination occurs. As a corollary, it is more difficult to carry out well-controlled studies of antibiotic efficacy. However, the frequency of trauma (an estimated three million major injuries in the United States each year and untold numbers of minor injuries) makes this an important area.

Several principles can be stated.[314] First, when indicated, antibiotics should be given as soon as possible. Second, it may be prudent to administer antibiotics shown to penetrate rapidly into traumatic wounds (ampicillin, penicillin, the cephalosporins, or tetracycline) rather than those that penetrate slowly (synthetic penicillins, gentamicin, clindamycin, and erythromycin).[315] Third, knowledge of the usual contaminating microorganisms will determine the optimum agent. Unfortunately, optimum duration of therapy following most types of trauma has not been well-established.

As a generalization, *The Medical Letter* suggests cefazolin for most dirty traumatic wounds and either the combination of gentamicin plus an aminoglycoside or cefoxitin with or without an aminoglycoside for trauma involving a ruptured viscus.[252] We shall briefly review various indica-

tions for prophylactic antibiotics in these settings.

2. *Simple Lacerations*

Simple lacerations, especially of the hand, are frequently encountered in medical practice. The serious staphylococcal and streptococcal infections occasionally complicating such lacerations might theoretically be prevented with antibiotics. The decision whether to give or not to give antibiotics routinely becomes an important cost-effective issue.

No well-controlled trials have demonstrated that prophylactic antibiotics are effective in this setting. Grossman et al. reported a randomized, prospective study of 265 patients with simple wounds of the hand requiring suturing.[316] Only three infections were encountered, and there were no differences between the placebo and treatment groups. Their infection rate (1.1 percent) is significantly lower than those reported in earlier trials (up to 9.8 percent) but suggests that skilled management of such lacerations makes antibiotics unnecessary. Subsets of patients who might benefit from antibiotics have not yet been identified.

3. *Bites*

Bite wounds account for an estimated one percent of emergency room visits and an estimated $30 million in health care costs. These include an estimated one to two million dog bites, 8,000 snake bites, and an unknown but apparently increasing number of human bites.

Penicillin is considered to be the drug of choice for animal bites. The association of *Pasteurella multocida* (for which penicillin is generally considered the drug of choice and tetracycline the best alternative) with dog and cat bites is well-known[317, 318] and can lead to serious consequences. As reviewed earlier, the amoxicillin/clavulanic acid combination (Augmentin) appears to be effective in bite wounds and would have the advantage of covering *S. aureus* as well as *P. multocida*, and many anaerobic pathogens.[175] However, the cost-effectiveness of this combination and also that of other regimens which might provide broader coverage has not been well-defined.[319] Data pertaining to the best approach to snake bites are especially limited.

The microbiology of bite wounds inflicted by more exotic animals can generally be predicted from knowledge of the species and its environment. For example, lion and tiger bites apparently carry the same risk of *Pasteurella multocida* as do bites by smaller members of the cat family.[320] Shark bites are potentially contaminated with marine vibrios, against which tetracycline would be reasonable prophylaxis.[321]

Penicillin G has been traditionally recommended for human bites, which are invariably contaminated with mixed aerobic and anaerobic flora. Although cephalexin (Keflex) has frequently been prescribed for bite victims, it would appear to have no advantages over penicillin. *Eikenella corrodens*, a microaerophilic gram-negative rod which is usually resistant to cephalosporins (Table 15), can emerge as an important pathogen in this setting. We, like others, have concountered instances of osteomyelitis of the hand due to *Eikenella corrodens* in persons sustaining clenched fist-bite wound injuries who were treated with cephalosporins.

4. *Head Trauma*

The major issue with regard to prophylactic antibiotics for head trauma victims concerns their use for patients with basilar skull factures.[253, 322] The evidence for and against use of antibiotics in patients with CSF leak is far from clear-cut. Traditionally, the pneumococcus has been the usual cause of post-traumatic meningitis and therefore penicillin (if shown to be effective) would be the rational choice for cost-effective prophylaxis. However, we, like others, have seen an increasing incidence of gram-negative rod meningitis in head trauma victims (often in patients who had received prophylactic antibiotics). Since the efficacy of antibiotics has not been shown, and since the duration of CSF leak usually cannot be predicted, our preference is not to use prophylactic antibiotics. Rather, we suggest close observation including lumbar puncture for any evidence of clinical deterioration.

5. *Chest Trauma*

Infection is a major contributing cause to late morbidity and mortality following chest trauma. However, again there are no clear-cut guidelines for choice and duration of prophylactic antibiotics. Walker et al.[323] reported that only 21 percent of 181 patients who received prophylactic antibiotics developed infections, compared to 66 percent of 73 patients who did not receive prophylactic antibiotics ($p < 0.005$). The study was retro-

spective and uncontrolled. Cefazolin would appear to be a reasonable choice when antibiotics are indicated.

Recently, administration of a first-generation cephalosporin to patients requiring chest tube placement for traumatic hemothorax could not be shown to lower the infection rate compared to placebo. The authors concluded that "the use of prophylactic antibiotics merely for the presence of a chest tube is an unsettled issue of no definitely proved benefit."[324]

6. Abdominal Trauma

There is wide agreement that abdominal trauma leading to fecal contamination of the peritoneal cavity calls for antimicrobial therapy. Contaminating microorganisms predictably include aerobic gram-negative rods and gram-positive cocci and anaerobic bacteria, especially *Bacteroides fragilis*. The combination of gentamicin (or tobramycin) and clindamycin has become a popular regimen for this purpose, and is generally regarded as "the standard."

Two recent studies demonstrated that cefoxitin alone was as effective as clindamycin combined with either gentamicin[325] or tobramycin.[326] In the latter study, both regimens were found to be superior to cefamandole.

Infection is an important cause of death in patients sustaining major abdominal trauma. All authorities seem to agree that antibiotics should be initiated prior to exploration. There is less agreement regarding the duration of therapy.

The operative findings may help to resolve this problem in individual patients. Ericcson et al. recently reported a study in which all patients received tobramycin and either clindamycin or metronidazole prior to exploration.[327] They classified abdominal trauma victims as being high risk if there was bowel penetration, major injury to the liver, spleen, or pancreas, incomplete hemostasis, or injury from a close range shotgun blast. They continued therapy postoperatively for three days for high risk patients, but gave all other patients only two additional doses. The incidence of infection was 19 percent among the high risk patients, but only 3.4 percent for the low risk patients. Their study suggests that about 30 percent of victims of penetrating abdominal trauma are actually "low risk" and can be treated with short-course prophylaxis.

7. Open Fractures

Antibiotics have demonstrated value in preventing infection following open fractures. The consensus recommendation is to use a cephalosporin (such as cefazolin) to reduce the likelihood of staphylococcal or streptococcal infection.

All too commonly, however, patients with open fractures develop colonization and infection by gram-negative rods. These organisms, such as *Enterobacter, Serratia,* and *Pseudomonas* species, are charactistically resistant to the agents used for prophylaxis and may lead to chronic osteomyelitis. One would predict that the longer the duration of initial prophylaxis, the greater the likelihood of colonization and superinfection by secondary pathogens.

Dellinger et al. are conducting a trial of one day's therapy with a long-acting cephalosporin (cenfonicid) versus five days' therapy with cefamandole.[328] Preliminary results suggest no difference in infection rates, suggesting that short-course therapy may become recommended practice for these patients.

D. MEDICAL INDICATIONS FOR PREVENTIVE ANTIMICROBIAL THERAPY

1. Prevention of Endocarditis

Difficult to diagnose and uniformly fatal if untreated, bacterial endocarditis continues to be an important disease. Our appreciation that endocarditis results from transient bacteremia suggests that administering antibiotics prior to events known to produce transient bacteremia would be effective prophylaxis

Unfortunately, no data demonstrate that endocarditis can in fact be prevented in man. The obstacles to such a demonstration are formidable. Durack has pointed out that, if one assumes that the risk of endocarditis following dental extractions is one in 500, an antibiotic is 100 percent effective for prophylaxis, and that a hospital ethics committee will approve the protocol, a randomized study involving 6,000 patients would be necessary to obtain marginal statistical signifcance (chi-square = 4.2, $p < 0.05$, one-tailed).[329] Failures of prophylaxis may be more common than generally believed even when the infecting microorganism is susceptible to the drugs used for prophylaxis. Fortunately, however, these cases of endocarditis usually respond readily to treatment.[330]

The cost of regimens for prophylaxis against endocarditis varies greatly (Table 28). The more expensive regimens are based on demonstrations that the combination of either penicillin G, ampicillin, or vancomycin plus an aminoglycoside is necessary in two situations. The first of these consists of genitourinary procedures carrying a risk of enterococcal bacteremia. The second situation is the experimental rabbit model of endocarditis, in which such a regimen was found to be more effective than penicillin alone for prevention of "viridans" streptococcal endocarditis. Given the high cost of some of these regimens, the need to discriminate between "high risk" and "low risk" settings for endocarditis becomes apparent.

Current American Heart Association recommendations take these factors into account.[331] A rational way to apply prophylaxis against endocarditis, we think, consists of weighing for each patient the cost of therapy against the cost of consequences should endocarditis occur (Table 29).

Endocarditis can be disastrous for patients with prosthetic heart valves. For such patients, it is best to err toward maximum prophylactic therapy despite the cost. Other patients with a high cost of consequences include those with aortic regurgitation and heart failure. It is estimated that mitral valve prolapse occurs in six to ten percent of our population, or in approximately 10 million Americans. This lesion was determined to be the most frequent condition among patients who developed endocarditis despite prophylactic therapy.[330] Bor and Himmelstein made some interesting predictions regarding the outcome for 10 million patients with mitral valve prolapse undergoing dental procedure: (1) with no prophylaxis, there would be two fatal and 47 nonfatal cases of endocarditis; (2) with penicillin, there would be five cases of endocarditis and 175 deaths from drug reactions; and (3) with erythromycin, there would be one fatal and 12 nonfatal cases of endocarditis.[332] This reasoning illustrates the value of weighing the cost of consequences for such decision-making.

TABLE 31. SOME REGIMENS FOR PRESUMPTIVE THERAPY OF SEPSIS OF UNCLEAR ORIGIN

Setting	Regimen	Potential pathogens poorly covered
Few risk factors	cefazolin + gentmicin	Enterococci; Pseudomonas aeruginosa; methicillin-resistant S. aureus; Bacteroides fragilis; Hemophilus influenzae; Rickettsial agents
Elderly person or patient with risk factors or with intra-abdominal sepsis	cefazolin + gentamicin + clindamycin or metronidazole	Enterococci; Pseudomonas aeruginosa
	cefoxitin + gentamicin	same as above
	third generation cephalosporin + clindamycin or metronidazole	Enterococci; some Pseudomonas aeruginosa
Neutropenia	antipseudomonal penicillin + cefazolin + tobramycin	Some Bacteroides fragilis; fungi; methicillin-resistant S. aureus
	antipseudomonal penicillin + tobramycin	same as above + marginal coverage against S. aureus
	antipseudomonal penicillin + tobramycin + vancomycin	Some Bacteroides fragilis; fungi
	tobramycin + vancomycin	Bacteroides fragilis; fungi
	third generation cephalosporin + tobramycin	Some Bacteroides fragilis; fungi
	third generation cephalosporin alone	Some Bacteroides fragilis; some Pseudomonas aeruginosa; fungi; methicillin-resistant Staphylococcus aureus; may be marginal against other gram-positive microorganisms

TABLE 29. RISK OF ENDOCARDITIS ACCORDING TO PATIENT CATEGORIES AND PROCEDURES

I. Risk according to patient category

A. High risk: prosthetic valves; AV fistulas; patent ductus arteriosus; coarctation of the aorta; ventricular septal defect; aortic valve disease (especially aortic regurgitation); mitral regurgitation; Marfan's syndrome; intra-atrial hyperalimentation catheters; previous endocarditis

B. Intermediate risk: mitral valve prolapse; tricuspid valve disease; pulmonic valve disease; asymmetric septal hypertrophy

C. Low or negligible risk: arteriosclerotic plaques; coronary artery disease; atrial septal defects; cardiac pacemakers; surgically corrected lesions without prosthetic implants

II. Risk according to procedures

A. High risk: dental procedures likely to cause bleeding; oral surgery involving teeth or gums; delivery, abortion, insertion of an intrauterine contraceptive device (IUD), or dilatation and curettage (D & C) in the presence of infection; tonsillectomy and adenoidectomy; urinary catheterization; passage of urethral dilators; cystoscopy; prostatectomy; drainage of abscesses; operations involving infected tissue

B. Low risk: minor dental procedures not causing bleeding; spontaneous loss of deciduous teeth; normal delivery, abortion, insertion of an IUD, or D & C in the absence of infection; cardiac catheterization or pacemakoer insertion; endotracheal intubation; or diagnostic procedures such as endoscopy of the gastrointestinal tract, barium enema, liver biopsy, or fiberoptic bronchoscopy

2. Other Medical Conditions Calling for Prophylaxis

Primary prevention of rheumatic fever, which is becoming a rare disease in the United States, [333] is discussed in Section IX. Whether or when to discontinue prophylactic therapy for patients who have experienced rheumatic fever often depends on clinical judgment; reference is made to guidelines published by the American Heart Association.[334]

Prophylactic therapy against urinary tract infection and traveller's diarrhea is discussed in Section VIII.

VIII. PRESUMPTIVE ANTIMICROBIAL THERAPY

A. PRINCIPLES

Ideally, antimicrobial therapy should be guided by the results of culture and sensitivity tests. In practice, this is frequently not the case. Prevalence surveys in American hospitals typically show that only 20 to 25 percent of all antibiotic usage is based on culture and sensitivity test results. A one-day study of antibiotic usage in 132 Italian hospitals indicated that only two percent of antibiotic usage was based on the results of sensitivity tests.[335]

These findings do not necessarily imply widespread misuse of antibiotics. They are explained in part by preventive (prophylactic) use of antibiotics. Another large portion of all antibiotic usage (in our experience, approximately 45 percent), consists of presumptive (or empiric) therapy of infectious syndromes.

In some instances, the severity of the clinical situation mandates presumptive therapy prior to the availability of culture and sensitivity results. In other instances, it is difficult to obtain "clean" bacteriology without placing the patient at some risk. For example, specimens obtained from lower respiratory infections are invariably contaminated by oropharyngeal flora unless one submits the patient to an invasive procedure. That presumptive therapy is widespread even at tertiary care centers with extremely sophisticated microbiology laboratories should come as no surprise.[336]

Presumptive therapy poses a delicate trade-off. On the one hand, many of us have seen patients die because therapy was withheld prior to diagnosis of what proved to be staphylococcal or gram-negative septicemia. On the other hand, we have also seen presumptive therapy complicate the diagnostic process, precipitate unwanted side effects, and add far more to the cost of medical care than drug acquisition costs alone. In addition, widespread presumptive therapy explains to a large extent the frequent emergence of drug-resistant microorganisms.[337]

Some principles of unsound and cost-ineffective presumptive therapy are shown in Table 30. A sequence for cost-effective presumptive therapy is shown in Figure 14. Before beginning presumptive therapy, we should ask three questions: (1) *What infectious syndrome might be present?* (2) *How severe is the syndrome?* (3) *How serious is the patient's underlying medical condition?*

(1) *What infectious syndrome might be present?* The syndrome should be defined as accurately as possible by history, physical examination, appropriate radiographic studies, and simple laboratory tests such as examination of peripheral blood smears, Gram's stains and urinalyses. This definition should include the anatomy of infection (i.e., cystitis or pyelonephritis? meningitis or brain abscess? tracheobronchitis or pneumonia?).

(2) *How severe is the syndrome?* Do subjective or objective data suggest that it may be life-threatening? Or do all parameters point either to a self-limited disorder or to one in which a 24 to 72 hour delay prior to instituting therapy is unlikely to have adverse consequences?

TABLE 30. SOME PRINCIPLES OF UNSOUND PRESUMPTIVE ANTIMICROBIAL THERAPY

1. Fever is always due to infection.
2. If temperature exceeds 101°F, give at least one antibiotic.
3. If temperature exceeds 103°F, give at least three antibiotics.
4. Physical examinations are a waste of time.
5. Examination of peripheral blood smears is a waste of time.
6. Gram's stain is a waste of time.
7. Don't worry about adverse reactions --- they're rare.
8. Never use a beta-lactam antibiotic if the patient gives any history of "penicillin allergy".

(3) *How serious is the patient's underlying medical condition?* Numerous studies have shown that patients with an "ultimately fatal disease" (defined as a process which, without treatment, would probably result in death within five years (such as multiple myeloma, severe cirrhosis, or end-stage renal failure) — tolerate infections poorly. In doubtful situations, one should err toward giving presumptive therapy to such patients. However, otherwise healthy persons often tolerate infectious syndromes of moderate severity surprisingly well. In doubtful situations, the odds may actually favor waiting for the etiology to be clarified either by the clinical course or by appropriate laboratory studies.

In many situations, it may be more cost-effective to prescribe presumptive therapy rather than to obtain expensive laboratory tests. However desirable in theory, cultures may be as expensive as our prescriptions. In other situations, presumptive therapy may be exceedingly costly (for example, by precipitating the Stevens-Johnson syndrome or

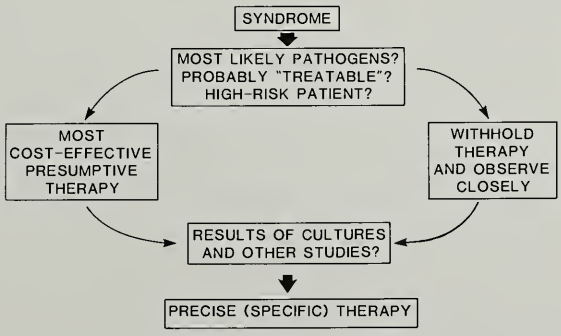


FIGURE 14. Accurate identification of the syndrome to be treated provides the starting point for this algorithmic approach to presumptive therapy (see text).

by obscuring the diagnosis of endocarditis). Answers to the preceding questions, combined with a review of the basic cost determinants (Table 1), will usually determine the need for prompt presumptive therapy.

Once we have determined that presumptive therapy is indicated, two additional questions should be asked.

(1) *What are the most likely pathogens and to what extent is it necessary to cover all or most of the possible pathogens?* Narrow-spectrum, relatively inexpensive therapy may be chosen if the etiology seems reasonably certain and if the likelihood of serious consequence from "missing the target" seems small (for example, suspected community-acquired *E. coli* urinary tract infection in a healthy young patient without obstructive uropathy). Broad-spectrum therapy, even if expensive, should be chosen if the infection is life-threatening (for example, acute bacterial meningitis) or if the patient is severely compromised (for example, if the patient has an ultimately fatal underlying disease as defined above, is elderly, or is receiving corticosteroids). It is helpful to keep in mind potential pathogens which might be poorly covered by the chosen regimen (Tables 31 through 36).

(2) *What is the response to initial therapy, and what do laboratory studies (including culture and sensitivity studies) reveal?* In addition to frequent evaluation of the patient's response, it is often helpful to all aspects of therapy after 72 hours. To this end, Young et al. proposed the "rules of three" for patients with suspected septicemia: if three blood cultures have been obtained, and if at the end of three days all are unrevealing, then it becomes progressively unlikely that bloodstream infection will be documented.[338] This rule takes advantage of the relatively rapid laboratory isolation of most aerobic pathogens within 48 hours, and probably applies to most acute aerobic bacterial infections. Within our lifetime, we can expect that advances in diagnostic microbiology will compress the three-day interval for re-assessment back to a single day or even to a few hours. Such advances would eliminate the need for much of our present-day presumptive therapy.

TABLE 28. COST OF SOME REGIMENS FOR PROPHYLAXIS AGAINST ENDOCARDITIS*

Regimen	Cost
Penicillin V, 2.0 g orally one hour before procedure, then 1.0 g orally 6 hours later *	$ 1.38
Ampicillin, 2.0 g IM plus gentamicin, 100 mg IM 30 min before procedure §	12.82
Ampicillin, 2.0 g IV plus gentamicin, 100 mg IV 30 min before procedure §	22.82
Vancomycin, 1.0 g IV over one hour starting one hour before procedure ¶	39.20
Vancomycin, 1.0 g IV over one hour plus gentamicin, 100 mg IM one hour before procedure ¶	45.20
Vancomycin, 1.0 g IV over one hour plus gentamicin, 100 mg IV one hour before procedure ¶	50.20
Erythromycin, 1.0 g orally one hour before procedure, then 500 mg orally 6 hours later †	0.54
Amoxicillin, 3.0 g orally 1 hour before procedure, then 1.5 g orally 6 hours later ‡	3.03

*Recommendations assume a weight of 70 kg and follow those given by Durack (Durack DT: Current views on prevention. Chapter 12 in Sande MA, Kaye D, Root RK [eds]: Endocarditis [New York: Churchill Livingstone, 1984]).

**Standard regimen for dental procedures and oral or upper respiratory tract surgery

§Parenteral regimen for high-risk patients and for genitourinary or gastrointestinal procedures

¶Parenteral regimen for patients allergic to penicillin (gentamicin-containing regimens being for procedures involving the genitourinary or gastrointestinal tracts).

†Oral regimen for patients allergic to penicillin undergoing dental, oral, or upper respiratory procedures.

‡Oral regimen for minor genitourinary and gastrointestinal procedures.

TABLE 32. SOME REGIMENS FOR PRESUMPTIVE THERAPY OF PNEUMONIA

Setting	Regimen	Potential pathogens poorly covered
Few risk factors	penicillin G	Mycoplasma pneumoniae; H. influenzae; Legionella pneumophila
	ampicillin	M. pneumoniae; L. pneumophila; some H. influenzae
	erythromycin	H. influenzae
	cefamandole	M. pneumoniae; L. pneumophila
	third-generation cephalosporin	M. pneumoniae; L. pneumophila
Risk factors such as chronic lung disease, alcoholism, old age, recent hospitalization, or neutropenia	cefazolin + gentamicin	H. influenzae; L. pneumophila; M. pneumoniae
	ampicillin + gentamicin	Klebsiella pneumoniae; S. aureus; L. pneumophila; M. pneumoniae
	antipseudomonal penicillin + gentamicin	M. pneumoniae; L. pneumophila; S. aureus
	cefamandole + gentamicin	M. pneumoniae; L. pneumophila
	third-generation cephalosporin	as above + marginal coverage against some S. aureus and Pseudomonas aeruginosa
Aspiration outside the hospital	penicillin G	Bacteroides fragilis; S. aureus; aerobic gram-negative rods
	clindamycin	aerobic gram-negative rods
Aspiration inside the hospital	clindamycin + gentamicin	fungi; may be marginal against some gram-negative rods, S. aureus, and enterococci
	clindamycin + third-generation cephalosporin	same as above
Atypical pneumonia--- "sick"	erythromycin + chloramphenicol	viruses; M. tuberculosis; fungi; Pneumocystis carinii
Atypical pneumonia-- "not very sick"	erythromycin	same as above + tularemia

TABLE 33. SOME REGIMENS FOR PRESUMPTIVE THERAPY OF MENINGITIS

Setting	Regimen	Potential pathogens poorly covered
Young to middle-aged adult	penicillin G	gram-negative rods; tuberculosis; viruses; fungi; S. aureus
neonate; post-trauma or neurosurgery; recent gram-negative bacteremia; chronic otitis media	third-generation cephalosporin *	Pseudomonas aeruginosa; Bacteroides fragilis; Listeria monocytogenes; tuberculosis; viruses; fungi

*In many of these settings (and especially in pediatric patients), other regimens are usually listed as the "antimicrobial therapy of choice" at the time of this writing; standard sources should be consulted.

TABLE 34. SOME REGIMENS FOR PRESUMPTIVE THERAPY OF INTRA-ABDOMINAL SEPSIS

Setting	Regimen	Potential pathogens poorly covered
Cholecystitis	cefazolin + gentamicin	enterococci; Bacteroides fragilis
	ampicillin + gentamicin	K. pneumoniae; Bacteroides fragilis
	cefoxitin + gentamicin	enterococci; some Bacteroides fragilis
	cefazolin + gentamicin + metronidazole or clindamycin	enterococci
Peritonitis	cefazolin + gentamicin + metronidazole or clindamycin	enterococci; fungi
	ampicillin + gentamicin + metronidazole or clindamycin	K. pneumoniae; fungi
	cefoxitin + gentamicin	enterococci; fungi; some Bacteroides fragilis
	third generation cephalosporin	enterococci; fungi; some Bacteroides fragilis and Pseudomonas aeruginosa
	antipseudomonal penicillin + gentamicin	some Bacteroides fragilis; fungi; S. aureus
	third generation cephalosporin + gentamicin	some Bacteroides fragilis; may be marginal against S. aureus and Pseudomonas aeruginosa; fungi

TABLE 35. SOME REGIMENS FOR PRESUMPTIVE THERAPY OF URINARY TRACT INFECTION*

Setting	Regimen	Potential pathogens poorly covered
Uncomplicated	cefazolin	Pseudomonas aeruginosa; some Enterobacteriaceae; enterococci; yeasts
Complicated	cefazolin + gentamicin	enterococci; yeasts
	ampicillin + gentamicin	yeasts
	TMP/SMX + gentamicin	enterococci; yeasts
	third-generation cephalosporin	enterococci; yeasts; some Pseudomonas aeruginosa
	antipseudomonal penicillin + gentamicin	yeasts

*Regimens for patients with evidence of tissue invasion; some regimens appropriate for lower urinary tract infection are shown in Tables 42 and 43.

TABLE 36. SOME REGIMENS FOR PRESUMPTIVE THERAPY OF ENDOCARDITIS

Setting	Regimen	Potential pathogens poorly covered
Subacute	penicillin + gentamicin	S. epidermidis; S. aureus; B. fragilis; fungi
Acute	penicillin + nafcillin + gentamicin	B. fragilis; fungi; methicillin-resistant S. aureus
	vancomycin + gentamicin	B. fragilis; fungi
Prosthetic valve	vancomycin + gentamicin	same as above
	penicillin + nafcillin + gentamicin	methicillin-resistant S. aureus and S. epidermidis; fungi; B. fragilis

B. FEVER WITHOUT OBVIOUS EXPLANATION

We define "fever without obvious explanation" as temperature exceeding 101 degrees F (38.3 degrees C) for which no logical cause becomes apparent after a careful history, a meticulous physical examination, and a few simple laboratory tests.

Note that this definition differs significantly from that of "FUO" (fever of unknown origin). According to the classic Petersdorf-Beeson criteria, true "FUO" denotes an illness of at least three weeks' duration with documented fever on at least several occasions and with no established cause after one week of investigation in the hospital setting. Thus defined, true "FUO" is a distinctly uncommon and indeed a changing clinical problem.[339] However, "fever without obvious explanation" as defined here is frequently encountered in daily medical practice.

In a few instances, presumptive antimicrobial therapy for "fever without obvious explanation" can be life-saving. Familiar examples include meningococcemia, Rocky Mountain Spotted Fever, and gram-negative septicemia in a compromised host. Patients with these disorders usually manifest other evidence of potentially life-threatening illness. In the absence of such evidence, the disadvantages of presumptive therapy may outweigh the potential benefits.

Clinical judgment determines whether it is preferable to give empiric therapy or to await further observation and the results of cultures and other studies. We should obtain these studies judiciously, remembering especially that ordering "febrile agglutinins" seldom provides the answer (unless one has strong reason to suspect tularemia or brucellosis) and is notoriously cost-ineffective.[340] The answers to several questions may be useful.

(1) *What was the mode of onset?* Ask of outpatients, "When did you last feel like your usual healthy self?" Illnesses with abrupt, dramatic onsets generally carry therapeutic urgency. Those with insidious onsets frequently prove to be of viral or mycoplasmal etiology. In hospitalized patients, careful examination of the vital sign records may indicate whether acute bacterial infection is likely.

(2) *Does the exposure history in combination with the clinical findings suggest a treatable infectious syndrome?* Examples include a history of camping in the Appalachians or Southeastern barrier islands with severe headache ("Rocky Mountain spotless fever"[341]), a history of parental drug abuse with or without a heart murmur (endocarditis), and a history of skinning rabbits with relative bradycardia (tularemia).

(3) *Is the patient taking any drugs known to cause fever?* Occasionally patients with drug fever have findings in various organ systems suggesting sepsis. Recently, we have encountered two patients with evidence of renal, hepatic, and even pulmonary involvement whose fevers proved to be due to the non-steroidal anti-inflammatory agent, sulindac (Clinoril).

(4) *Does the patient look "sick" or "toxic"?* This bedside observation — although difficult if not impossible to quantify — may be the best guide to whether presumptive therapy and/or intensive studies are warranted. In hospitalized patients, subtle changes in the vital signs such as an increased respiratory rate may provide valuable clues.

(5) *Is the patient likely to tolerate sepsis poorly?* Such patients include neonates, the elderly, the immunocompromised, and those with "rapidly fatal" or "ultimately fatal" underlying diseases as defined above. We should remember that elderly patients may have a paucity of complaints and physical findings (including fever) despite catastrophic events such as intestinal perforation. We should be liberal with presumptive antibiotics for patients with asplenia, due to their high risk of fulminant septicemia from microorganisms such as the pneumococcus and *H. influenzae*.

(6) *Are the white blood count and especially the peripheral blood smear consistent with bacterial (or fungal) sepsis?* Remember that patients with overwhelming bacterial disease may have a normal white blood count but tend to have the classic shift-to-the-left. However, patients who do not appear to be "toxic" and who have a normal white count with absolute or relative lymphocytosis seldom, in our experience, require presumptive antimicrobial therapy.

Ambulatory patients with "fever" frequently prove to have benign disorders.[342] The same can be true of hospitalized patients. In both instances, the clinical setting may suggest another diagnosis. For example, a 31-year-old woman abruptly developed fever of 105 degrees on the 36th day of hospitalization; she had previously experienced high fever due to *Bacteroides* septicemia followed by recurrent fever due to a *Bacteroides* abscess (Figure 15). However, the patient did not appear to be "toxic;" instead, she was emotionally upset that "the fever's come back!" A normal white count with relative lymphocytosis, combined with a history of multiple transfusions, suggested the possibility of cytomegalovirus mononucleosis, which was subsequently confirmed.[343] We now recognize that cytomegalovirus mononucleosis is an increasingly important cause of obscure fevers among young adults.[344]

In a sense, presumptive antimicrobial therapy for fever without obvious explanation is the ultimate cost-effectiveness issue. On the one hand, untold thousands of dollars can be saved not only by therapeutic restraint (withholding antibiotics) but also by diagnostic restraint (being parsimonious about ordering numerous cultures and other studies for what may prove to be a self-limited illness). On the other hand, the cost of consequences (notably, death due to untreated

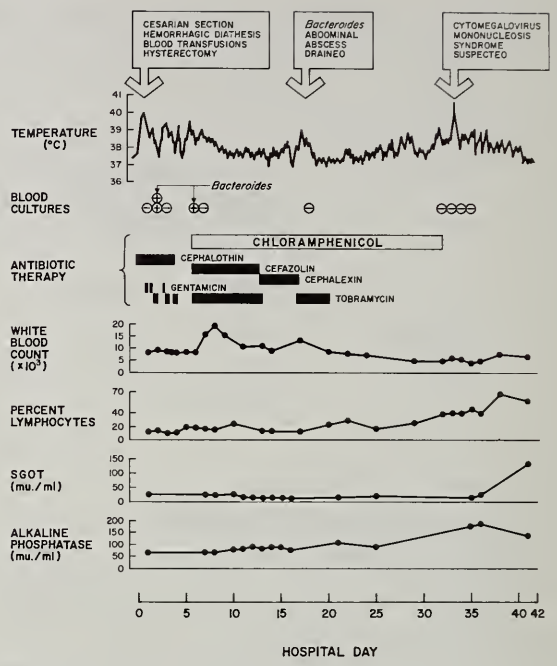


FIGURE 15. This experience in a postpartum patient reminds us that high fever is not always due to a treatable bacterial infection even when all of the clinical facts suggest otherwise. A stormy postoperative course after hysterectomy for intrapartum hemorrhagic diathesis was complicated by *Bacteroides* sepsis and later by *Bacteroides* wound abscess. When chloramphenicol was eventually discontinued, the patient's fever abruptly rose to 105 degrees — strongly suggesting recurrent *Bacteroides* infection. However, the fever proved due to transfusion-related cytomegalovirus infection and resolved without any therapy. Reprinted with permission from *The American College of Obstetricians and Gynecologists* (Obstetrics and Gynecology 52: 68s-69s, 1978).[343]

Rocky Mountain Spotted Fever or gram-negative septicemia) can be substantial. In general, it is best to have a reasonable hypothesis before embarking upon antimicrobial therapy. We shall now examine approaches to the problem of suspected bacteria septicemia.

C. SEPTICEMIA

Septicemia is properly defined by the presence of pathogens in the bloodstream (e.g., bacteremia or fungemia) accompanied by clinical evidence of sepsis (i.e., the harmful effects of pathogens or their products). Mortality among patients with septicemia continues to be quite high. It was determined in Denver, Colorado that the overall mortality among 500 patients with bacteremia and fungemia was 42 percent and that 46 percent of the deaths were directly due to the infection.[345] It was determined in Columbia, South Carolina that the overall mortality associated with 2,978

episodes of bacteremia was 30 percent and that 49 percent of the deaths were directly due to infection.[346] Clearly, clinical findings strongly suggestive of septicemia mandate prompt, presumptive antimicrobial therapy.

Two caveats should be mentioned. First, only a minority of patients (in our experience, about one in ten) for whom blood cultures are obtained for suspected sepsis actually prove to have bacteremia or fungemia. Presumptive therapy for all patients for whom blood cultures are obtained would lead to still-wider use of antibiotics with further increases in hospital costs and spread of drug-resistant organisms. Thus, judgment is necessary. Second, the effect of antibiotics for patients with septicemia is not immediate. Indeed, by destroying bacteria and thereby liberating their constituents such as endotoxin into the bloodstream, antibiotics may theoretically make things worse (although this has seldom been documented). Aggressive supportive care becomes vital to the immediate outcome. Current research efforts focus on the use of novel approaches such as passive immunization with agents inhibiting the activity of endotoxin.[347]

The cost of management of suspected septicemia includes not only the cost of antibiotics but also the cost of blood cultures and the cost of adjunctive measures such as corticosteroids. The optimum number of blood cultures (currently $30 to $50 apiece) has been debated for many years. Review of recent data suggests that the volume of blood cultured — rather than the number of cultures — is the key determinant. The optimum volume of blood appears to be 30 ml, and whether this is divided as three cultures of 10 ml each or two cultures of 15 ml each seems to be immaterial.[348, 349] Our recommendation is that 30 ml of blood (or three sets of cultures in most hospitals) should be obtained when clinical findings suggest life-threatening septicemia or endocarditis. For patients with less severe illness, we frequently recommend only two cultures, since the additional yield of the third culture is small. We can anticipate that newer methods for processing blood cultures will allow increasingly rapid and accurate recognition of pathogens in the bloodstream, thereby promoting cost-effectiveness.[350]

The potential role of corticosteroids in septicemia has been analyzed for more than two decades. Early studies suggested that "high doses" were ineffective. Next, it was suggested that the doses weren't high enough, and that "truly massive" doses were indeed beneficial. Now, two additional studies indicate that "truly massive" doses of either methylprednisolone (Solu-Medrol) or dexamethasone (Decadron) improve the early hemodynamic findings but do not improve the eventual outcome.[351-353] The potential role of other agents such as opiate antagonists or prostaglandin inhibitors remains to be clarified.

The costs of some standard regimens for suspected septicemia are shown in Table 37. For most patients, gentamicin and cefazolin ($65.71) continues to be the most cost-effective choice. This combination provides broad coverage against both gram-positive and aerobic gram-negative microorganisms. The significant "holes" in such coverage include methicillin-resistant strains of *Staphylococcus aureus*, *Bacteroides fragilis*, and certain penicillin G-sensitive, cephalosporin-resistant microorganisms (Table 15). Beyond this standard recommendation, we shall review three areas of ongoing controversy.

First, the role of newer, third-generation cephalosporins as monotherapy for suspected septicemia merits strong consideration. Compared to the gentamicin-cefazolin combination, monotherapy with a third-generation cephalosporin would provide less coverage against gram-positive cocci and *Pseudomonas aeruginosa*, "better" coverage (i.e., higher inhibitory quotients) against aerobic gram-negative rods, and less nephrotoxicity[354, 355] (Table 31).

In a randomized, prospective trial, Smith et al.[356] compared high-dose cefotaxime (two grams every four hours, or $143.28 per day) and a combination regimen of nafcillin plus tobramycin (1.5 grams every four hours and 120 mg every eight hours, respectively, or $121.85 per day) for patients with suspected serious bacterial infections. They concluded that the cefotaxime regimen was more effective and less toxic than the nafcillin/tobramycin regimen. It should be noted that only 36 of the 195 patients studied proved to have bacteremia. It is unfortunate that the regimens studied were not among the more cost-effective choices for either third-generation cephalosporins or for beta-lactam/aminoglycoide combinations (Table 37). Nevertheless, this study points the way for what should prove to be an ever-expanding search for more effective, safer, and less expensive alternatives.

Second, patients with suspected polymicrobic

TABLE 37. COST OF SOME REGIMENS FOR PRESUMPTIVE THERAPY OF SUSPECTED SEPSIS*

Regimen	Cost
Cefazolin, 1 g IV q8h + gentamicin, 120 mg IV q8h	$ 65.71
Cefamandole, 2 g IV q8h + tobramycin, 120 mg IV q8h	95.10
Nafcillin, 1.5 g IV q4h + tobramycin, 120 mg IV q8h	121.85
Cefotaxime, 2 g IV q4h	143.28
Cefotaxime, 2 g IV q8h	71.64
Cefoperazone, 2 g IV q12h	53.32
Ceftizoxime, 2 g IV q8h	72.06
Ceftriaxone, 2 g IV q24h	58.88
Ticarcillin, 3 g IV q4h + gentamicin, 120 mg IV q8h	106.62
Ticarcillin (3.1 g)/clavulanic acid q4h + gentamicin, 120 mg IV q8h	125.22
Piperacillin, 3 g IV q4h + tobramycin, 120 mg IV q8h	143.48
Azlocillin, 3 g IV q4h + amikacin, 500 mg IV q8h	186.78
Cefazolin, 1 g IV q8h + ticarcillin, 3 g IV q4h + gentamicin, 120 mg IV q8h	143.83
Cefamandole, 2 g IV q6h + azlocillin, 3 g IV q4h + tobramycin, 120 mg IV q8h	224.90
Nafcillin, 2 g IV q6h + gentamicin, 120 mg IV q8h	90.63
Vancomycin, 1 g IV q12h + gentamicin, 120 mg IV q8h	106.90
Gentamicin, 120 mg IV q8h + clindamycin, 600 mg IV q8h	85.08
Tobramycin, 120 mg IV q8h + clindamycin, 600 mg IV q8h	97.38
Penicillin G, 20 million units IV q24h by continuous infusion + gentamicin, 120 mg IV q8h + metronidazole, 750 mg orally q8h	47.95

*Daily costs based on average wholesale prices, January 1986.

"surgical" infections beneath the diaphram should usually receive an agent of choice against *Bacteroides fragilis* (Table 31). This issue has been discussed previously (Section V) and will also be discussed in the next section (Section IX). Although it has yet to be conclusively demonstrated that agents highly active against *Bacteroides fragilis* lower the initial mortality from septicemia, most authorities would not withhold such agents when *B. fragilis* infection seems likely.

Finally, neutropenic patients on oncology services carry a high risk of septicemia due to *Pseudomonas aeruginosa* and other aerobic gram-negative rods. Numerous comparative trials have addressed the potential superiority of one or another regimen for such patients. These trials have, in general, been inconclusive. One facet of current interest concerns the possibility of using two different beta-lactam antibiotics rather than a combined beta-lactam/aminoglycoside regimen for such patients. A "double beta-lactam" regimen (either cefoperazone/mezlocillin or cefoperazone/piperacillin) was recently reported to be as effective as the traditional three-drug regimen of ticarcillin, tobramycin, and cefazolin; it was concluded that cefoperazone/mezlocillin was the most cost-effective regimen, which the authors chose to use as a standard for further comparison.[357] At the present time, we are uncertain about the wisdom of such "beta-beta" combinations; further trials will be of interest.

D. UPPER RESPIRATORY INFECTIONS

1. Acute Pharyngitis

The extraordinary frequency of sore throat in general medical practice makes choice of management strategy, on a national basis, a major cost-effectiveness issue. It has been estimated that acute pharyngitis prompts over 15 million physician's office visits each year in the United States with an annual cost exceeding $300 million. Self-limited viral illnesses explain the great majority of cases. Approximately 15 percent of cases are due to group A streptococci.[358] Other treatable causes include gonococcal pharyngitis (which can be difficult to diagnose and treat), diphtheria (fortunately rare), and *Mycoplasma pneumoniae*

infection (responsive to erythromycin). Debate continues to focus on the most cost-effective management strategy to the problem of viral versus streptococcal pharyngitis.

A single throat culture detects group A pharyngitis with an accuracy of approximately 90 percent. For years, academicians and policy makers have argued whether it is more cost-effective to base therapy upon throat culture results or to treat empirically without obtaining cultures. For years, most practitioners have decided the issue for themselves.[359] Occasional studies suggest that the two strategies may be equally cost-effective, at least in some settings.[360]

In the next section, we shall address optimum treatment for group A streptococcal pharyngitis once this diagnosis has been established. Published algorithms address the likelihood that a particular patient may in fact have streptococcal rather than viral pharyngitis.[361] Empiric therapy may be warranted when symptoms and signs point clearly to a streptococcal etiology and when symptoms are severe. Empiric therapy may also be indicated when throat cultures are not readily available.

New commercially-available methods for rapid office diagnosis of streptococcal pharyngitis should simplify this problem.[362] These systems are based on antigen detection rather than culture, and generally provide an answer within one hour. Assuming that the volume of patients with "sore throat" in one's office practice justifies the acquisition of such a system, use of the antigen detection test in all but the most classic cases would seem to be the most cost-effective approach. The argument that giving all patients with a positive antigen test a single injection of benzathine penicillin G (Bicillin) would be more cost-effective has merit. However, this approach may expose many patients to an unnecessary risk of serious allergic reaction. Further, as will be discussed in section IX, the efficacy of benzathine penicillin G at eradicating group A streptococci from the pharynx may be less than was previously thought.

Other potentially treatable etiologies of acute pharyngitis, such as *Yersinia enterocolitica*,[363] continue to be described. An issue for practicing physicians has been whether to use erythromycin when studies for group A streptococci are negative, with the rationale of providing coverage against *Mycoplasma pneumoniae* and *Chlamydia*. A recent controlled trial of pharyngitis in adults indicated that erythromycin had a negligible effect on the duration of the illness but significantly reduced secondary illnesses among family members.[364] Further studies are needed!

2. Acute Otitis Media

During the first five years of life, middle ear disease may account for one-third of all office visits and three-fourths of all follow-up visits for illness of any kind.[365] Given the overall expense of managing otitis media, it is disturbing to note that recent studies cast doubt about the efficacy of such basic measures as decongestant-antihistamine combinations,[366] myringotomy, and even antibiotics.[367] Other arguments against therapy include observations that therapy does not seem to affect the duration of middle ear effusion[368] and that therapy might impair the development of protective immunity.[369] However, the effects of hearing impairment on early childhood development prompt most American physicians to prescribe antibiotics for this condition.

Current data indicate that *Streptococcus pneumoniae* and *Hemophilus influenzae* account for 54 percent of cases of acute otitis media in childhood and for 78 percent of cases in which a bacterial pathogen is present.[370] Since many regimens provide adequate coverage against the pneumococcus, therapeutic issues revolve primarily around optimum coverage of *H. influenzae*. As is well-known, widespread use of ampicillin for this indication explains, in part, the emergence of ampicillin-resistant *H. influenzae*. Nevertheless, it is still felt that ampicillin or amoxicillin is the most cost-effective initial agent for most patients.[370] The amoxicillin/clavulanic acid combination (Augmentin) offers a good alternative in areas with a high incidence of ampicillin-resistant *H. influenzae*.

There are other options: TMP/SMX, oral cephalosporins such as cefaclor, the fixed combination of erythromycin and sulfisoxazole (Pediazole), and more. A randomized trial suggests that TMP/SMX may be more effective than cefaclor at eradicating pathogens from the middle ear (95 percent versus 70 percent; almost but not quite statistically significant) and that TMP/SMX is more cost-effective.[371]

3. Acute Sinusitis

A distinction should be made between acute community-acquired maxillary sinusitis and the

other sinusitis syndromes.

Viral isolation studies support the hypothesis that most cases of acute community-acquired maxillary sinusitis result from the predisposition to bacterial infection brought about by viral syndromes. The bacteriology resembles that of acute otitis media, *Streptococcus pneumoniae* and *Hemophilus influenzae* being by far the most common isolates. *Staphylococcus aureus*, aerobic gram-negative rods, *Branhamella catarrhalis*, and various anaerobic bacteria may be present in some instances.[372-374] Among the currently acceptable therapeutic alternatives, cefaclor is quite expensive while TMP/SMX is relatively inexpensive (Table 38). One study indicates that amoxicillin and cefaclor are equally effective,[375] amoxicillin being the more cost-effective choice.

TABLE 38. COST OF SOME ORAL REGIMENS FOR ACUTE SINUSITIS*

Regimen	Cost, ten days
Ampicillin, 500 mg q.i.d.	$ 8.20
Amoxicillin, 500 mg t.i.d.	10.10
Bacampicillin, 800 mg b.i.d.	37.30
TMP/SMX, 160 mg/800 mg b.i.d.	9.80
Cefaclor, 500 mg q.i.d.	75.90

*Costs for ten-day courses of therapy based on average wholesale prices, January 1986

Therapy for other sinusitis syndromes should be individualized. Frontal, ethmoid, and sphenoid sinusitis carry the risk of such intracranial complications as subdural empyema, brain abscess, and cavernous sinus thrombosis. Sphenoid sinusitis is especially dangerous.[376] In these instances, antimicrobial coverage should include an effective antistaphylococcal agent and parenteral therapy may be preferred, at least initially. Nasogastric or nasotracheal tubes can predispose to hospital-acquired sinusitis, which is often due to gram-negative rods and which can present as a fever without obvious explanation.[377, 378] Presumptive therapy should include a drug with broad activity against aerobic gram-negative rods.

4. Acute Epiglottitis

This medical emergency carries the risk of sudden airway obstruction. Although most patients are young children, acute epiglottitis occasionally occurs in adults and should be suspected when patients complain of severe sore throat yet lack abnormal findings in the pharynx.[379] Suspicion of this syndrome should prompt attention to the airway followed by administration of antibiotics appropriate for *H. influenzae* (see Section IX). Therapy should also cover such occasional etiologies as *S. pneumoniae*, various streptococci, and other *Hemophilus* species. *Staphylococcus aureus* is mentioned as an infrequent etiology.

5. Anaerobic Infections of the Head and Neck

Anaerobic bacteria can be isolated in up to 91 percent of cases of chronic otitis media and 52 percent of cases of chronic sinusitis. In addition, anaerobic pathogens are usually present in severe soft tissue infections spreading along the fascial planes of the head and neck. High-dose penicillin G given by continuous infusion has been the most cost-effective approach to these pathogens. However, oropharyngeal anaerobic bacteria may be less susceptible to penicillin G than was formerly the case (i.e., the MIC values for penicillin against pathogens such as *Bacteroides melaninogenicus* may be relatively high). Our consensus would be to add either clindamycin or metronidazole to a penicillin regimen for patients with life-threatening illness.

E. LOWER RESPIRATORY INFECTIONS

1. Sputum Gram's Stain, Where art Thou?

Cost-effective therapy of lower respiratory tract infections is especially challenging. These infections are both common and serious. Pneumonia remains the leading infectious cause of death, capable of killing not only the elderly and the immunocompromised but also adults in the prime of life. There is, then, a natural tendency to use broad-spectrum, expensive regimens when diagnostic uncertainty exists — as is all too often the case.

The inevitable contamination of expectorated sputum by oropharyngeal flora makes microbiologic evaluation difficult. Fifteen years ago, Barrett-Connor proposed that the routine sputum culture might well be a sacred cow — time-honored, but without value.[380] Recent data support this suggestion. As carried out in some laboratories, examination of sputum by microscopic examination and culture appears to be of marginal or even doubtful value in the management of patients with pneumonia.[381, 382]

Commenting on the effect of prospective payment on management of pneumonia, Dans *et al*, documented the increasing tendency toward administration of broad-spectrum and usually expensive initial therapy. They noted frequent misuse of sputum cultures and x-rays. Patients whose cases were managed suboptimally had significantly higher hospital bills and greater length of hospitalization. The findings emphasized the need for better interaction between clinicians and microbiology laboratories.[383]

Technological innovations may simplify our approach to the problem of broad versus narrow spectrum initial therapy for pneumonia. Alternative methods for obtaining specimens do not yet seem to be practical for most patients. Transtracheal aspiration is too dangerous for routine use; fiberoptic bronchoscopy using a protected specimen brush is promising[384] but expensive. Counterimmunoelectrophoresis for identification of bacterial antigens in sputum has not been especially helpful in most hospital laboratories, but newer methods of antigen detection using coagglutination may be more promising.[385, 386] We believe that careful physician examination of a well-processed Gram's stain remains the best guide to cost-effective presumptive therapy.

For accurate Gram's stain evaluation, sputum should be fresh. Overnight standing in the refrigerator may change the predominant bacterial form, rendering the sample worthless.[387] The smear should be evaluated under low power to determine whether excessive numbers of squamous epithelial cells (e.g., greater than 25 per field) are present; if this is the case, the specimen should be discarded. Purulent sputum generally contains 25 or more polymorphonuclear leukocytes per low power field. Such a specimen is suitable for further microscopic study, which should include a search for typical bacterial forms, ideally visualized within the cytoplasm of polymorphonuclear leukocytes, in the thin areas of the smear.

A large literature addresses the specificity and sensitivity of Gram's stain findings for the diagnosis of pneumococcal pneumonia. Rein *et al*,[388] considered the Gram's stain to be positive if typical Gram-positive lancet-shaped diplococci were either predominant or if ten or more of these forms were present per oil immersion field. Sputum cultures from 90 percent of specimens with positive Gram's stains by the criteria yielded *S. pneumoniae*. However, Gram's stains were negative by these criteria in 38 percent of sputums yielding pneumococci by culture. Close evaluation of the smear by a concerned clinician, as opposed to routine processing by the laboratory, adds to its value. Special laboratory techniques such as washing the specimen may also be helpful.[389] Both the sensitivity and specificity of sputum examination can be improved by concomitant use of the Quellung reaction, but this somewhat time-consuming test is not widely employed in the United States.

Accurate identification of pneumococci may be the least of several compelling reasons to examine Gram's stains. Finding a predominance of gram-positive cocci in clumps (suggesting *S. aureus*) or of gram-negative rods can be life-saving. Sheets of small pleomorphic coccobacilli strongly suggest *Hemophilus influenzae* or *Acinetobacter calcoaceticus*.[390] The finding of many different bacterial morphologies including differently-shaped gram-positive and gram-negative microorganisms within the cytoplasm of individual leukocytes strongly suggests "aspiration" (mouth flora) pneumonitis due to a mixture of aerobic and anaerobic microorganisms. Finally, the finding of purulent sputum without bacteria can be helpful, sometimes indicating the presence of "chemical" aspiration pneumonitis, a situation in which the role of antibiotics is quite minor. The finding of purulent sputum without obvious bacteria also raises the possibility of an atypical pneumonia such as legionnaire's disease.

2. *Bronchiolitis, Bronchitis and Tracheitis*

Aware of no major studies of cost-effective antimicrobial therapy for these conditions, we shall mention them only briefly. Bronchiolitis of infancy is usually of non-bacterial etiology and therefore antibiotics are not indicated in most cases.[391] On the other hand, bacterial tracheitis in children can be due to a variety of bacteria including *Staphylococcus aureus*[392] and therefore requires combination therapy with an agent active against *H. influenzae* and a penicillinase-resistant penicillin, or amoxicillin/clavulanic acid (Augmentin) alone. *H. influenzae* can cause febrile tracheobronchitis not only in children but also in adults;[393] again, a carefully-performed Gram's stain carries therapeutic implications. In patients with chronic obstructive lung disease, acute exac-

erbations of bronchitis may be due to *S. pneumoniae*, *H. influenzae*, and perhaps other microorganisms including *Branhamella catarrhalis*. A variety of regimens including ampicillin, tetracyclines (to which many pneumococci are now resistant), TMP/SMX, and erythromycin have been used both for acute episodes and for prophylaxis. The cost-effectiveness of the different alternatives is not well-defined.

3. Pneumonia

Costs of some presumptive regimens for pneumonia are shown in Table 39. Among these alternatives, note that the cost ranges from $2.72 per day for procaine penicillin G to $201.24 for a more complex regimen. Since there is no evidence that the outcome of pneumococcal pneumonia (in the absence of meningitis or endocarditis) can be improved upon by larger doses of penicillin G, 600,000 units of procaine penicillin G given intramuscularly twice daily remains the best choice for most patients with classic pneumococcal pneumonia.

Classic pneumococcal pneumonia — manifested by the onset of a single shaking chill followed by pleuritic chest pain and cough productive of a mucoid, rusty sputum, findings of consolidation by physical examination and chest x-ray, and with myriads of lancet-shaped diplococci on Gram's stain — has become uncommon. Atypical presentations are frequent. Chest x-rays are more likely to show patchy bronchopneumonic patterns of infiltration than the classic lobar consolidation.[394] It should again be emphasized that evaluation including use of newer microbiologic techniques, when available,[385, 386, 395] may be of great value. When studies are nondiagnostic, the clinician must judge how widely to open the umbrella of antimicrobial coverage (Tables 32 and 40).

Some knowledge about the frequency of various pathogens in one's community may be helpful in choosing presumptive therapy regimens. For example, Klimek *et al*,[396] determined that among 204 patients hospitalized for pneumonia in one year at Hartford, Connecticut, the pneumococcus

TABLE 39. COST OF SOME REGIMENS FOR PRESUMPTIVE THERAPY OF PNEUMONIA*

Regimen	Cost
Procaine penicillin G, 600,000 units IM q12h	$ 2.72
Aqueous penicillin G, 2.5 million units IV q6h	25.57
Aqueous penicillin G, 20 million units IV q24h by continous infusion	13.15
Cefazolin, 500 mg IV q12h	17.40
Cefazolin, 500 mg IM q12h	7.40
Cefazolin, 1 g IV q8h	37.21
Erythromycin, 500 mg IV q6h	38.88
Erythromycin, 1 g IV q6h	57.76
Cefazolin, 1 g IV q8h + gentamicin, 120 mg IV q8h + erythromycin, 1 g IV q6h	123.47
Cefamandole, 2 g IV q6h + tobramycin, 120 mg IV q8h + erythromycin, 1 g IV q6h	170.96
Clindamycin, 600 mg IV q8h	56.58
Penicillin G, 20 million units IV q24h by continuous infusion + gentamicin, 120 mg IV q8h	41.65
Cefotaxime, 2 g IV q8h	71.64
Ceftriaxone, 2 g IV q24h	58.88
Cefoperazone, 2 g IV q12h	72.06
Ticarcillin, 3 g IV q4h + gentamicin, 120 mg IV q8h + erythromycin, 1 g IV q6h	164.38
Piperacillin, 3 g IV q4h + tobramycin, 120 mg IV q8h + erythromycin, 1 g IV q6h	201.24
Ceftriaxone, 2 g IV q12h + gentamicin, 120 mg IV q8h	87.38
Ampicillin, 2 g IV q6h	47.28

*Daily costs based on average wholesale prices, January 1986.

TABLE 40. CURRENTLY RECOMMENDED THERAPY FOR SOME ATYPICAL PNEUMONIAS

Etiology	Therapy of choice
Mycoplasma pneumoniae	erythromycin or tetracycline
Legionella pneumophila	erythromycin
Psittacosis	tetracycline
Q fever	tetracycline
Pneumocystis carinii	TMP/SMX or pentamidine
M. tuberculosis	isoniazid plus rifampin
M. avium-intracellulare	multiple drug regimen
Cryptococcus neoformans	amphotericin B, flucytosine, or ketoconazole
Aspergillosis	amphotericin B
Nocardiosis	sulfonamide or TMP/SMX
Actinomycosis	penicillin G
tularemia	streptomycin
Rocky Mountain spotted fever	chloramphenicol or doxycyline

was by far the most common organism but explained only 36 percent of episodes. *Hemophilus influenzae* (15 percent), *Legionella pneumophila* (14 percent), *Staphylococcus aureus* (eight percent), and *Klebsiella pneumoniae* (seven percent) should also be considered, and a variety of aerobic and anaerobic microorganisms were also encountered. Knowledge of the prevalance of *Legionella pneumophila* in one's community especially has therapeutic implications. Let us briefly consider some of the so-called atypical pneumonias (Table 40).

Erythromycin remains the drug of choice for pneumonia due both to *Mycoplasma pneumoniae* and *Legionella pneumophila*. Early diagnosis of both of these pneumonias can be difficult. *Mycoplasma pneumoniae* infection characteristically occurs in young adults; the extent of infiltrate on chest x-ray may be much greater than would be suggested by the appearance of the patient and the physical examination. Newer serologic studies may be helpful. Clues to legionnaire's disease may include neurologic or gastrointestinal symptoms, liver or renal involvement, and relative bradycardia. *Legionella* can be demonstrated by direct immunofluorescent staining of sputum especially in patients with multilobe involvement.[397]

As we noted earlier (Section V), an advantage of erythromycin is its ability to penetrate phagocytic cells. A disadvantage is that tracheobronchial secretion levels of erythromycin after oral administration are usually marginal, especially for *Legionella pneumophila*.[398] Intravenous erythromycin, which is not only expensive but also irritating to veins, must therefore be considered for patients with serious pneumonia possibly due to *Legionella pneumophila*.

Patchy, bilateral infiltrates raise the possibility not only of legionnaire's disease but also of bacteremic pneumonia (for example, due to right-sided staphylococcal endocarditis), unusual etiologies such as tularemia or psittacosis, and multiple pulmonary emboli (septic or non-septic). Diffuse pneumonias in immunocompromised patients pose special problems. In these patients, the need to obtain an accurate diagnosis justifies the use of invasive procedures as an alternative to blind, broad-spectrum presumptive therapy.[399-401]

In addition to these atypical pneumonias, several considerations may suggest the need for relatively broad-spectrum presumptive therapy for acute bacterial pneumonia. Elderly persons in nursing homes and patients who are immunocompromised have a relatively high incidence of pneumonias due to gram-negative pathogens such as *Klebsiella pneumoniae*.[402, 403] Alcoholic patients are predisposed to both *Klebsiella pneumoniae* infection and also to aspiration pneumonia due to "mouth flora" anaerobic bacteria. Small children and also persons with chronic lung disease have a high incidence of pneumonia due to *Hemophilus influenzae*. *Staphylococcus aureus* should be considered in the immunocompromised, the very young, and during influenza outbreaks. Several aspects of various presumptive therapy regimens (Table 32) warrant further comment.

First, aminoglycosides such as gentamicin are frequently recommended as first-line drugs for broad-spectrum therapy of pneumonias likely to involve pathogens other than the pneumococcus.[403] However, the rather poor penetration of aminoglycosides into tracheobronchial secretions combined with the acidic pH of these secretions leads to marginal activity[183] and high doses of aminoglycosides seem to be necessary.[24] It should be emphasized again that aminoglycosides have essentially no activity against the pneumococcus, and should therefore never be used alone for presumptive therapy of pneumonia.

Second, presumptive therapy of pneumonia may represent another niche for the cephalosporins. Among the first-generation agents for

parenteral use, cefazolin again seems to be the most cost-effective agent. A dose of 500 mg every 12 hours suffices for uncomplicated pneumococcal pneumonia;[404] the full dose of one gram every eight hours should "cover" *S. aureus* and (to some extent) *Klebsiella pneumoniae*. Among the second-generation agents, cefamandole has been widely used for therapy of community-acquired pneumonia but seems to have no clear advantage over two less-expensive alternatives: cefonicid[405] and ampicillin.[406] The third generation agents may have a major role in pneumonias due to aerobic gram-negative bacilli, appearing to be at least as effective as older combinations.[407, 408] A multicenter study indicated that ceftizoxime, cefotaxime, and moxalactam were equally effective in high-risk patients with hospital-acquired pneumonia, ceftizoxime having the fewest side effects.[409] Third-generation cephalosporins are effective for community-acquired pneumonia,[401] but are unnecessary in most instances. Finally, the extent to which broad-spectrum presumptive therapy predisposes to later complications remains unsettled. Earlier studies suggested that broad-spectrum therapy promoted colonization and superinfection by additional pathogens, especially gram-negative rods. Wide use of the newer broad-spectrum agents would, theoretically, predispose to pneumonias due to difficult-to-treat pathogens such as *Acinetobacter*, fungi, and even enterococci.[411] Case definition of secondary bacterial pneumonia can be difficult. Ideally, this problem should be monitored and correlated with antibiotic usage at individual hospitals.

4. Predominantly Anaerobic Pleuropulmonary Infection: Lung Abscess and Empyema

Penicillin G has traditionally been the most cost-effective therapy for infections due to aspiration of "mouth flora" anaerobic bacteria. The necessary dose of penicillin has been debated. Experience at some medical centers demonstrates that low-dose penicillin G (for example, procaine penicillin G 600,000 units intramuscularly every 12 hours) or even oral penicillin suffices. However, customary practice at most institutions has been to employ high-dose penicillin therapy. In our opinion, a cost-effective strategy is to use high-dose penicillin G by continuous infusion (e.g., 20 million units over 24 hours in patients with normal renal function) followed by prolonged therapy with oral penicillin after the initial response to therapy.

Two recent studies indicate that clindamycin may be more effective than penicillin G for therapy of lung abscess.[412, 413] These observations may be due, in part, to the development of penicillin resistance by some members of the normal oropharyngeal flora. Whether clindamycin is more cost-effective for the majority of patients is unclear. Our current preference is to reserve clindamycin for patients who are extremely ill or who do not improve after initial therapy with penicillin. Metronidazole, at least when used alone, is ineffective for management of aspiration pneumonia despite the predominantly anaerobic nature of this problem.[414]

F. ENDOCARDITIS

Improvements in blood culture techniques have made "culture-negative" endocarditis increasingly uncommon. Therefore, therapy for endocarditis can usually be guided by the results of culture and sensitivity tests, and *in vitro* studies such as the serum bactericidal titer can be utilized to determine the most cost-effective regimen for an individual patient.

Presumptive therapy for endocarditis is warranted in two situations (Table 36). The first of these is acute endocarditis, which is often due to *S. aureus*. Therapy should include an active antistaphylococcal agent, such as nafcillin, vancomycin, or cefazolin. Antistaphylococcal penicillins, even in combination with aminoglycosides, do not provide adequate coverage for enterococcal endocarditis.[415] Therefore, if the clinical setting is at all consistent with enterococcal infection, initial therapy should include penicillin G, an antistaphylococcal agent, and gentamicin. Vancomycin could be substituted for both of the beta-lactam compounds in this regimen, with the caveat that vancomycin-gentamicin therapy carries the risk of synergistic ototoxicity and nephrotoxicity.

The second situation is that of suspected "culture-negative" endocarditis in the presence of clinical deterioration in a patient with a prosthetic valve. This syndrome may be due to a variety of agents, including fungi. When clinical judgment suggests the need for therapy, presumptive therapy should be appropriate for enterococcal endocarditis as well as for "viridans" streptococcal endocarditis. The recommended duration of therapy for enterococcal endocarditis is four to six

weeks.[416] Presumptive therapy therefore becomes extremely expensive, emphasizing again the need to identify the causative microorganism.

G. INTRA-ABDOMINAL INFECTIONS

1. *Polymicrobic Surgical Infections in Situations Involving Fecal Contamination of the Peritoneal Cavity*

A large and well-publicized body of literature supports the thesis that most infections complicating peritoneal contamination by gastrointestinal contents are due to the combined effect of aerobic and anaerobic pathogens. Experimentally, aerobic pathogens (such as *E. coli*) cause early-onset septicemia, whereas anaerobic pathogens (such as *Bacteroides fragilis*) contribute to later abscess formation. Synergy between the aerobic and anaerobic components involves several mechanisms, of which the most important seems to be the ability of anaerobic bacteria (or their metabolic products or capsules) to inhibit the phagocytosis of aerobic bacteria by leukocytes.[417] Experimental studies also support the use of antibiotic coverage directed against both aerobic and anaerobic components of the normal intestinal flora (Table 34).[418]

Extrapolation from these experimental data to clinical guidelines for cost-effective antibiotic usage has been surprisingly difficult. Numerous trials have been conducted.[419, 420] Harding *et al*, reported cure rates between 79 percent and 90 percent with different regimens during four successive trials; there were no significant differences between regimens.[419] Solomkin *et al*, reviewed 16 comparative studies and found overall success rates were 84 percent for aminoglycoside/clindamycin regimens, 89 percent for aminoglycoside/metronidazole regimens, and 93 percent for cephalosporin-based regimens. The overall mortality for patients in these 16 trials was only 3.5 percent.[420] Obviously, "sicker" patients tend to be excluded from such trials. Generalizations about cost-effective therapy are therefore difficult to make.

Experimentally, use of agents highly active against *Bacteroides fragilis* favorably influences the outcome of infection involving fecal contamination of the peritoneal cavity. Metronidazole may be the most effective of such agents.[421] In clinical trials, it has not been possible to demonstrate superiority of metronidazole over clindamycin (using each in combination with gentamicin).[422, 423] Other studies indicate a comparable success rate with third-generation cephalosporins used as monotherapy.[424] It is difficult to make summary judgments concerning the various alternative possibilities (Table 34).

Antimicrobial therapy for situations involving fecal contamination of the peritoneal cavity must be individualized.[425] Determinants include the extent of infection, the presence and severity of compromising host factors, and whether the infection can be accurately localized and promptly drained.[426] Monotherapy with a cephalosporin (such as cefoxitin or cefotetan or a third-generation agent) seems reasonable for "good risk" patients. In a recent comparative trial, cefoxitin alone appeared to be as effective as the combination of tobramycin and clindamycin.[427] For "high risk" patients, we would prefer a regimen containing an agent highly active against *Bacteroides fragilis* (i.e., either clindamycin or metronidazole).

2. *Cholecystitis*

Whether antibiotics are necessary in acute, uncomplicated cholecystitis is controversial. Some alternatives for seriously ill patients (including patients with perforation of the gallbladder or emphysematous cholecystitis) are shown in Table 34. Cefazolin plus gentamicin is the least expensive of these options. Anaerobic pathogens can be frequently isolated from bile when careful techniques are used,[428] and therefore a drug active against *Bacteroides fragilis* has been recommended for presumptive therapy when infection is especially severe. Such a regimen might consist of either cefoxitin plus gentamicin or cefazolin or gentamicin and either metronidazole, clindamycin, or chloramphenicol (Table 34).[429] Although a large literature addresses the ability of various antibiotics to penetrate into bile, the applicability of such data to situations involving bile duct obstruction is questionable.

3. *Infectious Diarrhea*

Each passing year seems to add one or more new agents to the list of causes of infectious diarrhea. Presumptive therapy is warranted primarily for severe illness in which clinical evidence suggests one or another agent (for example, prior antibiotic usage suggesting *Clostridium difficile* infection or exposure suggesting shigellosis).

TABLE 41. ACTIVITY (MIC-90 VALUES) OF OLD AND NEW AGENTS AGAINST PATHOGENS CAUSING INFECTIOUS DIARRHEA*

Microorganism	"Old agents"		"New agents"	
	Amoxicillin	TMP/SMX	Ciprofloxacin	Aztreonam
Enteropathogenic E. coli	25	0.195	≤0.097	0.195
Enterotoxigenic E. coli	12.5	0.195	≤0.097	0.195
Enteroinvasive E. coli	25	0.195	≤0.097	0.78
Shigella	25	6.25	≤0.097	0.78
Yersinia enterocolitica	25	3.12	≤0.097	1.56
Aeromonas hydrophila	25	0.39	≤0.097	0.097
Salmonella, non-typhi	>100	100	≤0.097	0.195
Salmonella typhi	0.195	6.25	≤0.097	0.097
C. jejuni	12.5	50	0.39	not tested
C. coli	12.5	50	0.39	not tested

*Data are MIC-90 values in mcg/ml. From Goosens H, et al, Antimicrob Agents Chemother 27: 388-392, 1985.

TMP/SMX has the broadest range of currently-available agents against intestinal pathogens. For empiric treatment of traveller's diarrhea, both TMP/SMX and a new agent, bicozamycin, have been found to be effective.[430] Ciprofloxacin has remarkable activity against both common and uncommon agents causing infectious diarrhea (Table 41) and may become therefore a drug of choice for both presumptive and specific therapy.

H. URINARY TRACT INFECTIONS

1. Definitions

A large and growing body of literature addresses the issue of cost-effective management of urinary tract infection. These infections are both common and easy to study. Before we examine some of the current issues, let us define our terms.

By "urinary tract infection" is meant the finding of bacteria in bladder urine with or without clinical symptoms, and with or without renal disease. "Significant bacteriuria" indicates the finding of greater than 100,000 bacteria per ml of urine. This criterion provides a useful rule-of-thumb for interpretation of urine cultures, but it should be emphasized that many symptomatic patients have smaller numbers of organisms. These include both patients with chronic pyelonephritis and also patients with the so-called "urethral syndrome." Indeed, there are now so many exceptions that some observers consider the "10^5/ml" rule to be obsolete. "Asymptomatic bacteriuria" is quite common in certain populations. Both acute pyelonephritis and acute cystitis are primarily clinical diagnoses which can be substantiated by certain tests. Localization studies (such as those using ureteral catheterization or the bladder washout procedure) have confirmed the generalization that fever and flank pain indicate involvement of the upper urinary tract (i.e., pyelonephritis). On the other hand, lower urinary tract symptoms (dysuria, frequency, urgency) can occur in both cystitis and pyelonephritis. The "urethral syndrome," a term coined about a decade ago, refers to lower urinary tract symptoms unaccompanied by significant bacteriuria.

The antibody coated bacteria test, proposed as a method for distinguishing between upper and lower urinary tract infection, has not fulfilled its early promise. From a practical point of view, however, patients can be divided on the basis of whether the probability of tissue invasion is high or low. Factors increasing the probability of tissue invasion include fever and flank pain (indicating pyelonephritis), male sex (suggesting the presence of obstruction or prostatitis), known obstructive

uropathy or neurogenic bladder, and history of many previous episodes, early recurrence, diabetes mellitus, or renal transplantation. Most of the literature dealing with cost-effectiveness concerns "good risk patients" — typically female patients with recurrent episodes manifested by lower tract symptoms and signs and due to *E. coli* sensitive to all or most antibiotics.[431]

Bacteriologic definition of urinary tract infection can be accomplished cheaply, despite the substantial fee for formal "culture and sensitivity" studies by commercial laboratories (about $30 each). There are two current approaches. First, one can examine the urine microscopically. The finding of readily-identifiable rod-shaped bacteria (one per high power field) on unspun urine is predictive of significant bacteriuria. The absence of readily-identifiable bacteria on a Gram's stain prepared from the sediment of spun urine predicts a sterile urine culture.[432] Second, one can use one of the recently-introduced rapid screening tests for both bacteriuria and pyuria. In one representative study, for example, two such systems (one costing $0.40 per test and the other $1.30 per test) were both effective.[433] Arguments have been put forth that urine cultures are unnecessary for "good risk" patients with acute dysuria, and that it is more cost-effective to treat such patients empirically with antibiotics. However, we feel that these inexpensive methods for confirming bacteriuria and pyuria are worthwhile, especially for first episodes, since acute dysuria can have other etiologies — most notably, vaginitis.[434]

2. *Acute Cystitis — One Day, Ten Days, or Somewhere in Between?*

Antimicrobial therapy for acute cystitis used to consist of ten days of therapy followed by a test-of-cure culture. Underlying this practice was a belief that the end result of urinary tract infection — pyelonephritis — was the most common autopsy-determined cause of renal failure. This belief proved to be erroneous — an artifact brought about by reliance upon histologic criteria for the autopsy diagnosis of pyelonephritis. Insistence upon gross anatomical findings also consistent with pyelonephritis led to the recognition that pyelonephritis is a relatively infrequent cause of chronic renal failure.[435] As a corollary, therapy for women with acute cystitis should be much more cost-effective than was formerly the case.

Sulfisoxazole (Gantrisin) remains the least expensive of the conventional seven or 10 day regimens for acute uncomplicated cystitis (Table 42). Numerous trials have addressed the possibility that single dose therapy might be as effective as longer courses of therapy; a partial list of single-dose regimens is shown in Table 43. In general, these trials indicate that single-dose therapy is just as effective as extended, multidose therapy.[436-440] These findings have prompted the suggestion that single-dose therapy is the preferred method for treating "uncomplicated UTI."[441]

TABLE 42. COST OF SOME ORAL REGIMENS FOR URINARY TRACT INFECTION*

Regimen	Seven days	Ten days
Sulfisoxazole, 500 mg tabs, II q.i.d.	$ 5.46	$ 7.80
Ampicillin, 500 mg q.i.d.	5.74	8.20
Ampicillin, 250 mg q.i.d.	2.94	4.20
Amoxicillin, 500 mg t.i.d.	7.07	10.10
Amoxicillin, 250 mg t.i.d.	3.78	5.40
Cefadroxil, 1 g b.i.d.	35.84	51.20
Cefadroxil, 1 g eaily	17.85	25.50
Cephalexin, 500 mg q.i.d.	34.65	49.50
Cephradine, 500 mg q.i.d.	37.59	53.70
Nitrofurantoin, 100 mg q.i.d.	17.08	24.40
Tetracycline, 500 mg q.i.d.	2.87	4.10
Tetracycline, 250 mg q.i.d.	1.41	2.10
TMP/SMX, 80 mg/400 mg b.i.d.	4.20	6.00
TMP/SMX, 160 mg/800 mg b.i.d.	6.86	9.80

*Based on average wholesale prices, January 1986.

TABLE 43. COST OF SOME SINGLE-DOSE REGIMENS FOR URINARY TRACT INFECTION*

Regimen	Cost
Sulfadoxime, 2 g p.o.	$ 5.17
Sulfisoxazole, 2 g p.o.	1.57
Kanamycin, 500 mg i.m.	10.34
Amoxicillin, 3 g p.o.	2.02
TMP/SMX, two double-strength tabs p.o.	0.98
Tetracyline, 2 g p.o.	0.41
Ceftriaxone, 500 mg i.m.	13.77

*based on average wholesale prices, January 1986.

A recent compilation of the data from all 14 randomized controlled studies on this subject suggested that if single-dose therapy is to be used, TMP/SMX seems to be the preferred agent and is superior to amoxicillin. However, it was also suggested that the cure rate is lower with single-dose TMP/SMX than with a multidose regimen, and

that "for less antibiotic, the patient receives less effective treatment."[442]

Is a compromise regimen — somewhere in between single-dose therapy and seven to 10 days of therapy — a viable alternative? The answer may be "yes." Comparing a single dose therapy with cefadroxil or TMP/SMX with three days of therapy with either agent or seven days of cefadroxil, Greenberg et al. found at the end of four weeks that the cure rate was highest (88 percent) among patients who received three days of TMP/SMX.[443]

Either single-dose therapy or a three day regimen with TMP/SMX may be the preferred approach to "uncomplicated UTI." Evidence of tissue invasion mandates both longer therapy and also follow-up cultures.

TABLE 44. SOME STRATEGIES FOR PREVENTION OF RECURRENT URINARY TRACT INFECTION WITH TMP/SMX*

Frequency	Dose	Disadvantages
daily at bedtime	½ tablet	adverse reactions colonization with resistant organisms long-term cost
thrice weekly	1 tablet	remembering to take it
postcoital	½ to 1 tablet	remembering to take it inconvenience
single dose when symptomatic	4 tabs	reliance on patient for self-diagnosis no microbiologic confirmation

*Regimens based on various studies in the literature and using regular-strength TMP/SMX tablets (80 mg of trimethoprim and 400 mg of sulfamethoxazole).

3. Strategies for Recurrent Cystitis

It has long been observed that certain women are especially prone to recurrent cystitis. The biochemical basis for this susceptibility now seems to be within our grasp.[444] Bacterial colonization of the introitus predisposes to infection, which is often precipitated by coitus.[445] Based in part on our understanding of pathogenesis, a variety of preventive strategies have been proposed (Table 44).[446, 447] In our opinion, the most sensible strategies may be either the administration of TMP/SMX (as little as one-half of a regular-strength tablet) after coitus or self-therapy during acute episodes.[447, 448]

4. Pyelonephritis

Acute pyelonephritis should be treated aggressively. We suggest at least fourteen days of therapy. Parenteral therapy should be instituted in the febrile, possibly bacteremic patient (Table 35). The necessary duration of parenteral, as opposed to oral therapy is poorly defined.

Death from acute bacteremic pyelonephritis is now uncommon save in the most high-risk patients.[302, 449] Although it has been recommended that fourteen days of parenteral ampicillin should be given to patients with acute nonobstructive pyelonephritis,[450] we feel that oral therapy can usually be instituted quite safely after patients become afebrile and symptoms have improved. The rationale here is that many beta-lactam agents and other agents including TMP/SMX are well-concentrated in the urine (in the absence of renal failure) and that a successful outcome has been shown to correlate with urine levels of antibiotic, not serum levels. We are unaware of data indicating that relapse is greater among patients treated by this approach as opposed to 14 days of parenteral therapy.

For acutely ill, febrile patients with pyelonephritis, initial parenteral therapy options include cefazolin (especially for patients whose organisms are likely to be sensitive to all antibiotics), aminoglycosides (of which gentamicin would again be the most cost-effective), or newer cephalosporins.[432] Once-daily outpatient therapy with a long-acting agent such as cefonicid (for community-acquired cases) or ceftriaxone (for hospital-acquired cases) would enable early discharge from the hospital (or, for selected patients, therapy entirely in the outpatient setting). A case could be made that even initial therapy for "good risk" patients can be given orally. We would not advocate this approach for patients with hypotension or for the elderly — who are at high risk of septic shock from pyelonephritis.[451] The optimum duration of therapy for patients with obstructive pyelonephritis is unknown.

5. The Urethral Syndrome

Current data indicate that the urethral syndrome (as defined above) is frequently due to *Chlamydia trachomatis;* it may also be due to coliform bacteria, *Staphylococcus saprophyticus* (a species of coagulase-negative staphylococci with especial affinity for the urinary tract), and the gonococcus.[452] Doxycyline appears to be effective in patients with pyuria. In patients without

pyuria, antibiotics seem to be of little if any value.[453] We are unaware of any comparative studies of cost-effectiveness.

6. Prostatitis

Acute bacterial prostatitis often responds satisfactorily to antimicrobial therapy. Chronic bacterial prostatitis, which should be distinguished from "prostatosis," ranks among the most frustrating of all infections. TMP/SMX may be the most effective among current therapeutic alternatives.[454] Difficulties include poor penetration of most agents into the prostate and inability to ascertain cure. We are unaware of any major comparative studies of cost-effectiveness.

I. GYNECOLOGIC INFECTIONS

1. Pelvic Inflammatory Disease

The incidence of pelvic inflammatory disease appears to be increasing especially among young white women.[455] The potential for even mild salpingitis to cause sterility and for serious disease to cause tubo-ovarian abscess makes aggressive antimicrobial therapy desirable. Therapeutic options range from expensive regimens requiring two weeks of hospitalization (or outpatient intravenous therapy) to relatively inexpensive regimens for outpatients (Table 45). Therapy should include either doxycycline or tetracycline for 10 to 14 days, since chlamydial infection capable of leading to sterility can persist despite apparent clinical cure.[456]

The most commonly-isolated microorganisms include anaerobes (especially peptococci, peptostreptococci, and *Bacteroides* species), gonococci, enterococci, and *E. coli*.[457] Aerobic gram-negative rods other than *E. coli* are infrequent, so that the expanded aerobic gram-negative spectrum of many newer beta-lactam agents seems unnecessary in this setting.

Ampicillin plus tetracycline would be the least expensive of the regimens shown in Table 45. Severe disease should be treated with a more intensive regimen, especially in view of evidence that aggressive antimicrobial therapy of early tubo-ovarian abscess may reduce the likelihood of the patient's requiring total abdominal hysterectomy and bilateral salpingoophorectomy for cure.[458, 459]

Therapeutic trials of different regimens for pelvic inflammatory disease have been essentially inconclusive.[419, 460] On theoretical grounds, it should be possible to devise even more inexpensive regimens. Goodrich[457] calculated that the theoretical efficacy of TMP/SMX plus tetracycline would be 94 percent; adding chloramphenicol would increase the theoretical efficacy to 96 percent. Metronidazole could also be incorporated into such a regimen, with the caveat that pregnancy should be excluded prior to treatment.

2. Mucopurulent Cervicitis

Mucopurulent cervicitis due to *Chlamydia trachomatis* appears to be the counterpart of nongonococcal urethritis in males. The finding of yellow endocervical mucopurulent discharge (grossly or confirmed microscopically) suggests the diagnosis. As in males, coinfection by the gonococcus may be present. Doxycyline and tetracycline appear to be equally effective; doxycyline is more expensive but seems to be better tolerated.[461]

3. Non-specific Vaginitis

Current criteria for non-specific vaginitis include the finding of a homogenous, watery vaginal discharge with pH above 4.5, a "fishy" odor after adding sodium hydroxide, and "clue cells" on a saline wet mount. This infection seems to be multifactorial, with *Gardnerella vaginalis* and with anaerobic microorganisms (including peptostreptococci and *Bacteroides)* perhaps acting in concert. Metronidazole appears to be the most cost-effective therapy despite *in vitro* resistance of *Gardnerella vaginalis* to metronidazole. Ampicillin, more effective *in vitro* against *Gardnerella vaginalis* but less effective clinically, ranks among the alternatives for pregnant patients.[462-464]

J. CENTRAL NERVOUS SYSTEM INFECTIONS

1. Acute Bacterial Meningitis

Approaching this medical emergency, cost should be a minor consideration. Acute meningitis calls for high doses of bactericidal antibiotics capable of penetrating into the cerebrospinal fluid.[465-467] For patients presenting to the hospital or clinic with the syndrome of fever and stiff neck, the physician should ideally allow no more than 30 minutes to elapse before administration of the

TABLE 45. COST OF SOME REGIMENS FOR PELVIC INFLAMMATORY DISEASE*

Regimen	10 days	14 days
A. Outpatient regimens**		
1. Cefoxitin plus doxycycline	$ 48.53	$ 61.57
2. Amoxicillin plus doxycycline	34.62	47.66
3. Ampicillin plus doxycyline	34.04	47.08
4. Aqueous procaine penicillin G plus doxycycline	35.70	48.74
B. Inpatient regimens§		
1. Cefoxitin, 2 g IV q6h plus doxycycline, 100 mg IV q12h	1,323.80	1,853.32
2. Clindamycin, 600 mg IV q6h plus gentamicin, 120 mg IV q6h	1,039.40	1,455.16

*Regimens listed are those given in Morbidity and Mortality Weekly Report, 34: 4S (October 18,1985 supplement issue, "1985 STD Treatment Guidelines". Costs are based on average wholesale prices, January 1986.

**These regimens utilize a single dose of either cefoxitin (2.0 g IM), amoxicillin (3.0 g by mouth), ampicillin (3.5 g by mouth), aqueous procaine penicillin G (4.8 m.u. IM), or ceftriaxone (250 mg IM), with each of these regimens except the ceftriaxone regimen being accompanied by probenecid 1.0 g by mouth, followed by doxycyline (100 mg by mouth b.i.d.) for 10 to 14 days. It should be noted that doxycycline explains the major portion of the cost of each of these regimens, and that the alternative (tetracycline, 500 mg by mouth q.i.d.) would be much less expensive ($5.74 for a 14 day course compared to $45.64). Drawbacks of tetracycline include inconvenience (and hence less compliance) caused by more frequent dosing; less activity against certain anaerobes; and greater likelihood of side effects.

§These regimens given by the Centers for Disease Control are cited as examples with the acknowledgement that treatment is poorly standardized. Regimens should be continued for at least four days and should be followed by oral doxycycline (or clindamycin).

first dose of effective antibiotic therapy.[468] Review of 135 consecutive cases of acute community-acquired meningitis in Columbia, South Carolina, indicated that this desideratum was met much less frequently in adult patients compared to pediatric patients.[469]

Recommended therapy for acute bacterial meningitis continues to be age-dependent (Table 33). In young children, effective coverage against *H. influenzae* as well as *S. pneumoniae* and *N. meningitidis* is mandatory. A case can be made that chloramphenicol alone should be adequate initial therapy, despite the widespread recent practice of combining chloramphenicol with ampicillin.[470] For adults with meningitis, high-dose penicillin G (20 to 24 million units daily, assuming normal renal function, by continuous intravenous effusion) remains the most cost-effective choice. Penicillin G is not appropriate presumptive therapy for patients at high risk of aerobic gram-negative rod meningitis (such as patients who have recently undergone neurosurgery).

Newer cephalosporins have a promising role for presumptive therapy not only for gram-negative rod meningitis (see section IV) but also for men-

(Continued on page 213)

Continuing Medical Education

Second Quarter 1986 Calendar

James M. Long, III, M.D., Chairman

Published by the S.C.M.A. Committee on Continuing Medical Education
Post Office Box 11188, Columbia, S.C. 29211

APRIL

WEDNESDAY - SUNDAY

APRIL 22-27

CHARLESTON, Sheraton Charleston

"SCMA's 138th ANNUAL MEETING AND SCIENTIFIC ASSEMBLY"

SPONSOR: South Carolina Medical Association

DESCRIPTION: SCMA's Annual Meeting is offering more than 50 hours of Continuing Medical Education, from which a physician can select up to 21.5 CME hours. AAFP Credit Prescribed for.

AUDIENCE: M.D.'s

FACULTY: Staff and Guest

CONTACT: Donna Murphy, (803) 798-6207

THURSDAY-FRIDAY APRIL 3-4
CHARLESTON, Mills House Hotel
"Current Topics in Gastroenterology (1986)
SPONSOR: Gastroenterology Division, MUSC
DESCRIPTION: Highlight recent clinical advances in gastroenterology with emphasis on clinical application of newer developments in diagnosis and treatment of common hepatic and G.I. problems.
AUDIENCE: Primary Physicians
CONTACT: William M. Lee, M.D., (803) 792-2301
CME CREDIT: 13.5 Hours AAFP Prescribed

SUNDAY-WEDNESDAY APRIL 6-9
CHARLESTON, Mills House
"Seventeenth Annual OB/GYN Conference"
SPONSOR: Medical University of South Carolina
CONTACT: Division of CME-MUSC, (803) 792-4435
CME CREDIT: AMA Category I - Applied For
CEU - Applied For

MONDAY-WEDNESDAY APRIL 7-9
CHARLESTON, Mills House Hotel
"17th Annual Spring Symposium OB/GYN Reproductive Endocrinology and Infertility"
SPONSOR: Medical University of South Carolina
DESCRIPTION: The symposium will address the contemporary management of infertility.
AUDIENCE: OB/GYN and Family Physicians
FEE: $275 before March 7, $300 after March 7
FACULTY: Guest and MUSC
CONTACT: Odessa Ussery or Valerie Walton, (803) 792-8585
CME CREDIT: 14.5 Hours AMA Category I, 14.5 ACOG Congnates, 1.45 CEUs

WEDNESDAY-SATURDAY APRIL 16-19
HILTON HEAD ISLAND, Shipyards Plantation
SPONSOR: University of South Carolina School of Medicine
DESCRIPTION: To educate physicians on the appropriate management of patients to avoid common illnesses and the unwanted complications of illnesses.
AUDIENCE: Primary Physicians
CONTACT: Howard R. Nankin, M.D., Juraj Osterman, M.D., (803) 733-3112
CME CREDIT: 17 Hours AAFP Prescribed

THURSDAY APRIL 17
COLUMBIA, Carolina Inn
"Eighth Annual S.C. Tuberculosis Conference"
SPONSOR: American Lung Association of South Carolina
DESCRIPTION: An update on state of the art diagnosis, treatment and follow-up of tuberculosis. A look at trends in South Carolina and across the country.
AUDIENCE: M.D.s and Public Health Workers
CONTACT: John Heavener, Jr., (803) 765-9066

MAY

FRIDAY-SUNDAY MAY 2-4
KIAWAH ISLAND, Kiawah Island Resort
"1986 Annual Meeting and Scientific Program"
SPONSOR: South Carolina Dermatological Association
AUDIENCE: Dermatologists
CONTACT: Donna Murphy, (803) 798-6207
FEE: $25 Member (no fee for residents or speakers)
$75 Non-member
FACULTY: Harold Perry, M.D., Mayo Clinic
J. Graham Smith, M.D., Medical College of Georgia
John Maize, M.D., MUSC
Henry Roenigk, M.D., Northwestern University
CME CREDIT: 6 Hours Category I AAD

FRIDAY MAY 16
CHARLESTON, Quality Inn Hotel
"Health Care Management Seminar Series"
SPONSOR: Medical University of South Carolina
CONTACT: Division of CME-MUSC, (803) 792-4435

JUNE

MONDAY-THURSDAY JUNE 9-12
KIAWAH ISLAND, Kiawah Island Inn
"Internal Medicine - Recent Advances"
SPONSOR: Medical College of Georgia
DESCRIPTION: Update
AUDIENCE: Primary Care Physicians, Internist
CONTACT: Glen E. Garrison, M.D., (404) 828-3998
CME CREDIT: 27 Hours AAFP Prescribed

WEDNESDAY-SUNDAY JUNE 11-15
HILTON HEAD ISLAND, See Pines Plantation, See Pines Conference Center
SPONSOR: Lloyd Noland Hospital and Health Center
DESCRIPTION: To update the primary care physician treating adults on new knowledge in adult infectious diseases as well as underscoring important old knowledge.
AUDIENCE: Primary Care Physicians
CONTACT: George M. Converse, M.D., (205) 783-5276
CME CREDIT: 19 Hours AAFP Prescribed

GRAND ROUNDS
U.S.C. School of Medicine

2nd and 4th WEDNESDAYS 3:00-4:00
GASTROINTESTINAL RADIOLOGY CONFERENCE
COLUMBIA, VA Radiology Dept. Conference IC 209, VA Hospital
SPONSOR: USC School of Medicine, Dept. of Radiology and Gastroenterology and Division of Internal Medicine
DESCRIPTION: One-half of the conference will be a discussion and film review of a specific subject. The second half will be devoted to current case material with both radiographic and endoscopic findings.
AUDIENCE: Radiologists, Gastroenterologist and other interested physicians
CONTACT: James J. Farrell, M.D., (803) 733-3295
FACULTY: USC School of Medicine, Dept. of Radiology; Division of Gastroenterology, Internal Medicine and Guest Speakers
CME CREDIT: 1 Hour AMA Category I per session

MONDAYS 7:00 A.M.
ORTHOPAEDIC GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital - 1st Floor
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

MONDAYS 4:00 P.M.
BASIC SCIENCES SEMINAR SERIES
CONTACT: Louis Terracio, Ph.D., (803) 733-3373

MONDAYS-THURSDAYS 12:00-1:00 P.M.
INTERNAL MEDICINE LECTURE SERIES
Richland Memorial Hospital 7 West Classroom
CONTACT: J. O'Neal Humphries, M.D., (803) 765-6563

2st & 3rd MONDAY 12:30 P.M.
G.I. JOURNAL CLUB
Dorn Veterans' Hospital Room 5A127
CONTACT: John Orchard, M.D., (803) 776-4000 Ext. 673

MONDAYS, TUESDAYS, WEDNESDAYS, & THURSDAYS 12:00-1:00 P.M.
FAMILY PRACTICE CONFERENCE
COLUMBIA, Richland Memorial Hospital, Large Dining Room of the Cafeteria—Mondays—Family Practice Conference Room—Tuesdays and Thursdays
SPONSOR: Dept. of Family Practice, USC School of Medicine
AUDIENCE: Family Practice and Internal Medicine Physicians and Medical Students
CONTACT: Roslyn D. Taylor, M.D., (803) 765-6118, Dept. of Family Medicine Richland Memorial Hospital, Columbia, SC
FACULTY: Dept. of Family Medicine and Internal Medicine, USC School of Medicine
CME CREDIT: 1 Hour AMA Category I per session

TUESDAYS 7:00 A.M.
BASIC SCIENCE & PATHOLOGY ASPECTS OF ORTHOPAEDICS
Richland Memorial Hospital - Radiation Therapy Conference Room
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

3rd TUESDAY 12:30 P.M.
OB/GYN GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital
SPONSOR: USC Dept. of OB/GYN, RMH, MUSC, Spartanburg Greenville
DESCRIPTION: One of a series of live interactive broadcasts over HCN, a statewide closed circuit TV network for CME in OB/GYN.
CONTACT: Ronald B. Wade, M.D., (803) 765-7156
FEE: None
CME CREDIT: 1 Hour AMA Category I (per session)

FRIDAYS 8:00 A.M.
PEDIATRIC GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital
SPONSOR: USC School of Medicine, Dept. of Medicine
CONTACT: Warren Derrick, M.D., (803) 765-7211
CME CREDIT: 1 Hour AMA Category I (per session)

WEDNESDAY 12:00 NOON
PSYCHIATRY GRAND ROUNDS
Hall Institute Form
CONTACT: Bonnie Ramsey, M.D., (803) 758-8052
CME CREDIT: 1 Hour AMA Category I (per session)

4th WEDNESDAY 12:00 NOON
PATHOLOGY: MORTALITY TEACHING CONFERENCE
Room 3A110, Building 100, Dorn Veterans' Hospital
CONTACT: Nicholas J. Pappas, Jr., M.D., (803) 776-4000, Ext. 394 or 3
CME CREDIT: 1 Hour AMA Category I

2nd & 4th WEDNESDAY 12:00 NOON
PULMONARY MEDICINE CHEST CONFERENCE
Richland Memorial Hospital, 7th Floor Conference Room
1st & 3rd THURSDAYS 12:00 NOON
3rd Floor Conference Room, Dorn Veterans' Hospital
CONTACT: Gerald N. Olsen, M.D., (803) 733-3112

WEDNESDAYS 6:00 P.M.
ORTHOPAEDICS PROBLEM CONFERENCE
Richland Memorial Hospital Conference Room "P", ACC II
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

THURSDAYS 10:00 A.M.
HEMATOLOGY/ONCOLOGY GRAND ROUNDS
Dorn Veterans' Hospital, 5-West Classroom
CONTACT: George P. Satiano, M.D., (803) 733-3112

4th THURSDAY 12:00 NOON
G.I. RESIDENTS CONFERENCE
Dorn Veterans' Hospital, 4th Floor Conference Room
CONTACT: John Orchard, M.D., (803) 776-4000, Ext. 673

1st THURSDAY 4:00 P.M.
RADIOLOGY DEPT. CONTINUING EDUCATION CONFERENCE
USC School of Medicine Library Bldg., Room B-116
CONTACT: David F. Adcock, M.D., (803) 733-3295
CME CREDIT: 1 Hour AMA Category I

THURSDAYS 12:00 NOON-1:00 P.M.
ENDOCRINE CASE PRESENTATION
USC School of Medicine Administration Bldg. 2nd Floor Conference Roo
CONTACT: Juraj Osterman, M.D., (803) 733-3112

FRIDAYS 7:00 A.M.
ORTHOPAEDIC SUB-SPECIALTY TOPICS
Richland Memorial Hospital - Large Private Dining Room
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

FRIDAYS 2:00-4:00 P.M.
PREVENTIVE MEDICINE GRAND ROUNDS
USC School of Medicine Library Bldg. Room 327
CONTACT: Alan Chovil, M.D., (803) 733-3306
CME CREDIT: 2 Hours AMA Category I

3rd FRIDAY **12:00 NOON-1:30 P.M.**

NEUROPSYCHIATRY AND BEHAVIORAL SCIENCES
Dix Conference Room, William S. Hall Psychiatric Institute
CONTACT: Robert J. Pary, M.D., (803) 758-3068

FRIDAYS **1:00 P.M.**
INTERNAL MEDICINE GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital Auditorium
SPONSOR: Dept. of Medicine, USC School of Medicine
AUDIENCE: Internal Medicine and Family Practice Physicians
CONTACT: J. O'Neal Humphries, M.D., Chairman, Dept. of Medicine, (803) 765-6563
CME CREDIT: 1 Hour AMA Category I

SATURDAYS **9:00-10:00 A.M.**
SURGICAL GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital Auditorium
SPONSOR: USC School of Medicine, Dept. of Surgery
DESCRIPTION: Lectures and case presentations given by the department staff and guest speakers
AUDIENCE: Faculty, Residents, Students and Private Clinicians
CONTACT: Carl H. Almond, M.D., (803) 254-4158; James L. Haynes, M.D., (803) 765-7452; Frederick L. Greene, M.D., (803) 776-4000, Ext. 582
FACULTY: Staff of Dept. of Surgery and guest lecturers
CME CREDIT: 1 Hour AMA Category I (per session)

GRAND ROUNDS
Medical University of South Carolina

MONDAYS **8:30-9:30 A.M.**
PATHOLOGY (ext. 3121) Surgical Pathology Conference
Quadrangle - Room E215

MONDAYS **12:30-1:30 P.M.**
RADIOLOGY (ext. 5071) Noon Conference
Hospital — Room B317

MONDAYS **4:00-5:00 P.M.**
RADIOLOGY (ext. 5071) Special Imagining Conference
Hospital — Room B312

MONDAYS
RADIOLOGY (ext. 5071) Visiting Radiologist
Hospital — Room 315B

EVERY OTHER MONDAY **10:00 A.M.-12:00 NOON**
PATHOLOGY (ext. 3121) Pathology Microscopic Roundtable Conference
Quadrangle Building — Room E215

4th MONDAY **2:30-3:30 P.M.**
LABORATORY MEDICINE (ext. 2858) Phlebotomist: Inservice Update Program
Hospital — 2 West Classroom

TUESDAYS **7:00-8:00 A.M.**
SURGERY (ext. 3961) Surgical Grand Rounds - Cancer Conference
2-W Amphitheater —MUH

TUESDAYS **7:00-8:00 A.M.**
ORTHOPAEDIC SURGERY (ext. 3934) Grand Rounds — Weekly
MUSC — Room 428

TUESDAYS **11:00 A.M.-12:00 NOON**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4050)
Departmental Grand Rounds — MUH Amphitheater

TUESDAYS **12:30-1:30 P.M.**
OBSTETRICS/GYNECOLOGY(ext. 4509)
TV Grand Rounds in Obstetrics and Gyncology
MUH — Amphitheater

2nd & 4th TUESDAY **1:30-3:00 P.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE 577-5011 (ext. 234)
Case Conference
Veterans' Administration Hospital

TUESDAYS (as scheduled) **9:00-11:00 A.M.**
PATHOLOGY (ext. 2456/3121)
Seminar-Tutorial Groups Sessions, Systemic Pathology
Basic Science Building or Quadrangle (where scheduled)

TUESDAYS **8:30-9:30 a.m.**
OBSTETRICS/GYNECOLOGY (ext. 4509) Morning Conferences
Clinical Science Building — Room 624

TUESDAYS **2:00-3:30 P.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4050)
Adult Outpatient Case Conference
University Service Building — Chairman's Conference Room

2nd & 4th TUESDAY **4:00-5:00 P.M.**
PATHOLOGY (ext. 3121) Renal Conference
Basic Science Building — Room 648

1st & 3rd TUESDAY **4:00-5:00 P.M.**
PATHOLOGY (ext. 3121)
Gastrointestinal Pathology Conference (GI Conf)
Basic Science Building — Room 648

WEDNESDAYS (except last) **9:00-10:00 A.M.**
PATHOLOGY (ext. 2131) Graduate Medical Education in Pathology
Basic Science Building — Room 648

LAST WEDNESDAY **9:00-11:00 A.M.**
PATHOLOGY (ext. 3121) Grand Rounds — Pathology
Basic Science Building — Room 648

WEDNESDAYS **10:00-11:00 A.M.**
LABORATORY MEDICINE (ext. 2671) Blood Bank Conference
Quadrangle/Pharmacy — Room 209/310

WEDNESDAYS **12:00 NOON-1:00 P.M.**
PSYCHIATRY & BEHAVORIAL SCIENCE (ext. 4037)
Psychiatry Journal Club
University Service Building — Chairman's Conference Room

WEDNESDAYS **1:00-2:00 P.M.**
LABORATORY SERVICES (577-5011 ext. 466)
Charleston Veterans' Administration Clinical Pathology Conference
Veterans' Administration Hospital — Room B-243

4th WEDNESDAY **2:30-3:30 P.M.**
CYTOTECHNOLOGY/HISTOTECHNOLOGY (ext. 2041)
Histotechnology Journal Club
Quadrangle — Room QE 215

WEDNESDAYS **3:00-4:00 P.M.**
PATHOLOGY (577-5011 ext. 466)
Charleston Veterans' Administration Medical Center Tumor Board
Veterans' Administration Hospital

WEDNESDAYS **3:00-4:00 P.M.**
LABORATORY MEDICINE (ext. 2933) Hematology Conference
Quadrangle — Room B-106

WEDNESDAYS **6:30 P.M.-?**
OBSTETRICS/GYNECOLOGY (ext. 4509)
Monthly Journal Club Meeting — Outside Location

WEDNESDAYS **6:00-7:00 P.M.**
RADIOLOGY (ext. 5071) Low Country Ultrasound Society
Hospital — Room B-317

THURSDAYS **8:30-9:30 A.M.**
OBSTETRICS/GYNECOLOGY (ext. 4509) Morning Conference
Clinical Science Building — Room 624

THURSDAYS **8:00-9:00 A.M.**
RADIOLOGY (ext. 5071) Teaching Conference in Neuroradiology
Hospital — Room B-317

THURSDAYS **8:30-10:00 A.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4037)
Psychiatry Youth Conference — Clinical Science Building - Room 623C

THURSDAYS **8:30-10:00 A.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4037)
Teaching Case Conference for Consultation/Liaison Service
Clinical Science Building — Room 623C

THURSDAYS **8:30-10:00 A.M.**
PSYCHIATRY (ext. 3051) Child Psychiatry Seminar
Clinical Science Building — Room 623C

THURSDAYS **9:30-10:30 A.M.**
NEUROSURGERY (ext. 2421) Neurosurgery Clinical Conference
Clinical Science Building — Room 428

THURSDAYS **10:30-11:30 A.M.**
NEUROLOGY (ext. 3221) Neurology Grand Rounds
Clinical Science Building — Room 300

THURSDAYS **10:30-11:45 A.M.**
NEUROSURGERY (ext. 2421) Neurosurgery Lecture
Clinical Science Building — Room 300

THURSDAYS (as scheduled) **9:00-11:00 A.M.**
PATHOLOGY (ext. 2456/3121)
Seminar-Tutorial Group Sessions, Systemic Pathology
Basic Science Building or Quadrangle (where scheduled)

THURSDAYS **12:00 NOON-1:00 P.M.**
PATHOLOGY (ext. 3581/3121) Neuropathology Conference
Basic Science Building — Room 737

THURSDAYS **1:00-2:00 P.M.**
PATHOLOGY & DERMATOPATHOLOGY (ext. 3821/3121)
Dermatopathology Conference — Quadrangle-Room E215

THURSDAY (once/month) **2:30-3:30 P.M.**
LABORATORY MEDICINE (ext. 2671)
Immunohematology Journal Club — Quadrangle Room 104

THURSDAYS **4:15-5:30 P.M.**
NEUROSURGERY (ext. 2421) Neurosurgery Didactic Lectures
Clinical Science Building — Room 428

1st THURSDAY **5:30-7:30 P.M.**
NEUROSURGERY (ext. 2421) Journal Club

FRIDAYS **8:30-10:00 A.M.**
MEDICINE/ENDOCRINOLOGY (ext. 2528)
Endocrinology Journal Club, Endocrinology Research Conference
Clinical Science Building — Room 910

FRIDAYS **10:00-11:30 A.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE
Teaching Case Conference, Adult Inpatient
MUH — Room 7W Conference Room

FRIDAYS **12:00 NOON-1:00 P.M.**
PATHOLOGY (ext. 3556/3121) Clinico-Pathologic Conference (CPC
Mu Hospital — Room 2W Ampitheater

FRIDAYS **2:30-4:00 P.M.**
MEDICINE (ext. 2000) Division Rounds (Case Conference)
of the Division of Rheumatology & Immunology
Clinical Science Building — Room 912

FRIDAYS **4:00-5:30 P.M.**
MEDICINE/ENDOCRINOLOGY (ext. 2528)
Endocrinology Case Conference
Clinical Science Building — Room 906E

FRIDAYS **8:30-9:30 A.M.**
PATHOLOGY (ext. 3121) Surgical Pathology Conference
Quadrangle — Room E215

FRIDAYS **12:30-1:30 P.M.**
RADIOLOGY (ext. 5071) Noon Conference
Hospital — Room B317

FRIDAYS **4:00-5:00 P.M.**
RADIOLOGY (ext. 5071) Special Imagining Conference
Hospital — Room B312

FRIDAYS
RADIOLOGY (ext. 5071) Visiting Radiologist
Hospital — Room 315B

FRIDAYS **8:30-9:30 A.M.**
OBSTETRICS/GYNECOLOGY (ext. 4509) Morning Conferences
Clinical Science Building — Room 624

CONTINUING MEDICAL EDUCATION COMMITTEE

James Long, M.D., Spartanburg General Hospital, Spartanburg 29303 — CHAIRMAN
Frederick G. Jones, M.D., Memorial Hospital, Anderson 29621
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O. Marion Burton, M.D., Memorial Hospital, Anderson 29621 — SPEAKER

ingitis due to traditional pathogens. MIC-90 values for these newer agents against *S. pneumoniae*, *H. influenzae*, and *N. meningitidis* are typically quite low. For pediatric meningitis, ceftriaxone seems to be just as effective as the traditional chloramphenicol plus ampicillin combination.[471] For adult gram-negative meningitis, agents with somewhat better CSF penetration than ceftriaxone, such as ceftizoxime, might be preferred for this purpose although comparative trials have not appeared.

2. Brain Abscess

Early diagnosis of brain abscess prior to the appearance of neurologic signs can be difficult. Fever is present in no more than 50 percent of cases. Presumptive antimicrobial therapy should usually be combined with attempts to define the microbial etiology. Recent experience suggests that aspiration of brain abscesses combined with intense antimicrobial therapy frequently enables successful therapy without the need for total excision of the abscess.[472]

Optimum presumptive therapy for brain abscess is not clearly defined.[473] Gram-positive cocci, especially streptococci, are present in a majority (60 to 70 percent) of brain abscesses, and penicillin G therefore continues to be a mainstay of therapy. These abscesses often include anaerobic bacteria; *Bacteroides* species have been isolated in up to 40 percent of cases. Clindamycin should not be used due to lack of penetration into cerebrospinal fluid, which is presumed to be important. Many authorities now prefer metronidazole over chloramphenicol for presumptive therapy of brain abscess.[474] The combination of penicillin G plus metronidazole is dramatically effective in selected patients.[475]

In summary, high-dose intravenous penicillin G (again, by continuous infusion if possible) and metronidazole (which can be given orally in selected patients) appears to be the most cost-effective therapy for many patients. However, coverage should be individualized especially when aerobic gram-negative bacilli and *S. aureus* are present or cannot be excluded.

K. BONE AND JOINT INFECTIONS

1. Septic Arthritis

When initial studies including examination of a Gram's stain of joint aspirate are non-diagnostic, appropriate presumptive therapy for septic arthritis should usually include an agent active against *H. influenzae* in children and against *S. aureus* in all age groups. Beyond the first five years of life, cefazolin may be the most cost-effective choice for presumptive therapy for most patients. Additional coverage against aerobic gram-negative rods might be added for the elderly or the immunocompromised. The diversity of microorganisms capable of causing septic arthritis makes documentation of the etiology especially desirable.

Gonococci are often difficult to recover from joint effusions. When the clinical setting strongly suggests gonococcal disease, an empiric trial of penicillin G may be appropriate. Gonococcal strains causing arthritis or the arthritis-dermatitis syndrome remain, almost without exception, exquisitely sensitive to penicillin. Initial therapy is usually intravenous; continuous administration of 10 million units daily in a single bag or bottle of fluids should suffice. Oral therapy with ampicillin or amoxicillin is probably equally effective, especially if the patient does not have a large, purulent effusion.[476]

2. Osteomyelitis

Current recommendations hold that acute hematogenous osteomyelitis should be treated with parenteral antibiotics for four weeks, and that chronic osteomyelitis should be treated for as long as a year.[477] For therapy to be cost-effective, isolation of the causative organism(s) is highly desirable, and ideally even initial therapy should be guided by examination of Gram's stains. Cultures of draining sinus tracts in patients with chronic osteomyelitis can give misleading information; whenever possible, bone biopsy for culture should be carried out.[478]

Acute hematogenous osteomyelitis in younger patients is most often due to *Staphylococcus aureus*. Cefazolin may be the most cost-effective therapy. Presumptive therapy for persons with sickle cell disease should include coverage against *Salmonella* species, whereas therapy for the elderly or the immunocomprised should include broad coverage against gram-negative rods. Osteomyelitis due to a contiguous focus of infection is often polymicrobic and difficult to treat. Presumptive therapy can be based, in part, upon knowledge of the contiguous infection, which often contains an anaerobic component.

Osteomyelitis of the small bones of the feet secondary to vascular insufficiency in diabetics is characteristically due to a mixture of aerobic and anaerobic microorganisms.[479, 480] In one recent study, a mean of approximately three aerobic and two anaerobic species was identified in each patient; the density of the anaerobic organisms exceeded that of the aerobic organisms.[480] The combination of oral metronidazole and a beta-lactam agent may be the most cost-effective approach to this difficult and frustrating problem.

L. CELLULITIS

No attempt will be made here to catalog the numerous superficial infections of the skin. There is a need for better definition of cost-effective antimicrobial therapy for such common conditions as furunculosis.

Prompt therapy of acute cellulitis may prevent late complications such as lymphedema. Unusual etiologies may be suggested by the history. These include marine vibrio infections after exposure of wounds to salt water (tetracyclines may be the drugs of choice with aminoglycosides being required for severe cases); *Aeromonas hydrophila* infections after similar exposure in fresh water (gentamicin may be the most cost-effective drug for presumptive therapy); and erysipeloid in handlers of saltwater fish, shellfish, meat, and hides (penicillin is the drug of choice). However, we have generally considered most cases of acute cellulitis to be due to group A beta hemolytic streptococci. Even small areas of streptococcal cellulitis may be associated with severe systemic systems. Since these organisms continue to be exquisitely sensitive to penicillin G, low-dose penicillin (such as procaine penicillin G 600,000 units intramuscularly twice daily followed by oral therapy after improvement) would be the most cost-effective choice.

Data regarding the precise etiology of cellulitis are surprisingly limited. Both blood cultures and also cultures of skin aspirates are usually sterile. Recently, Hook et al.[481] carried out alternative culture methods including skin biopsies. Cultures from the apparent primary site of infection revealed group A beta-hemolytic streptococci in 75 percent of 24 patients. However, *S. aureus* was present in 58 percent of these patients, and both group A streptococci and *S. aureus* were isolated in 42 percent of patients. Other data support the staphylococcal origin of many episodes of cellulitis.[482, 483] Therefore, use of an agent with anti-staphylococcal activity for presumptive therapy seems reasonable. Unless methicillin-resistant strains of *S. aureus* are present in an area, cefazolin may be the most cost-effective choice for presumptive therapy. Penicillin G, possibly more effective for streptococcal disease, might be chosen if a streptococcal etiology seems reasonably certain.

IX. PRECISE ANTIMICROBIAL THERAPY

A. GROUP A STREPTOCOCCAL PHARYNGITIS

Optimum management of this common problem continues to spark controversy.[484] In the previous section, we briefly reviewed management strategies pertaining to the complaint of "sore throat." In this section, we shall assume that cultures (or other methods, such as the latex antigen test) have confirmed group A streptococcal pharyngitis.

Not very long ago, medical students learned three dogmas: (1) penicillin therapy prevents rheumatic fever but does not shorten the duration of symptoms; (2) rheumatic fever complicates three percent of cases of streptococcal pharyngitis, irrespective of the infecting streptococcal strain; and (3) one cannot improve over therapy with intramuscular benzathine penicillin G. Each of these dogmas now seems to have been erroneous.

Two recent studies confirm earlier suggestions that therapy of streptococcal pharyngitis shortens the duration of the illness.[485, 486] Treated patients feel better. This finding tends to refute the "purist" approach that therapy ought to be postponed until culture results confirm the diagnosis.

Prevention of rheumatic fever no longer seems like the urgent desideratum that it once did. The "three percent" figure, which was actually based on studies performed on military bases during World War II, no longer applies. In suburban populations especially, acute rheumatic fever is becoming a vanishing disease. One explanation holds that group A streptococci do, in fact, vary in their rheumatogenicity (i.e., ability to precipitate rheumatic fever). Should this observation prompt a less aggressive therapeutic approach?[487]

Finally, failures do occur with benzathine penicillin G — as high as 13 to 20 percent in recent studies.[488] One explanation is that some strains

exhibit tolerance (see Section III). However, nearly all group A streptococci remain exquisitely sensitive to penicillin G.[489] Another explanation is that the relatively small amounts of penicillin delivered to the tonsillar and pharyngeal surfaces may be inactivated by beta-lactamases produced by other resident microorganisms (both aerobic and anaerobic) in the oropharyngeal flora.[490-492]

Benzathine penicillin G remains the least expensive regimen for streptococcal pharyngitis. Occasional prospective trials support the practice of combining benzathine penicillin G with procaine penicillin G for more rapid eradication of both the streptococci and the local symptoms.[493] Oral phenoxymethyl penicillin V K is, with patient compliance, also cost-effective. Erythromycin remains the drug of choice for penicillin-allergic patients, although up to five percent of group A streptococci may be erythromycin-resistant.

Whether to carry out test-of-cure cultures in this setting is controversial. Unless these cultures can be carried out inexpensively, we suggest reserving such cultures for highly-selected patients (for example, patients with rheumatic heart disease or previous rheumatic fever).

A small but growing body of evidence suggests that therapy with beta-lactamase-resistant drugs may be more effective than penicillin therapy for eradicating group A streptococci from the pharynx. Such strategies include use of beta-lactamase inhibitors (e.g., the amoxicillin/clavulanic acid combination, Augmentin), or clindamycin.[494] Recently, Ginsburg et al. found that penicillin V and cefadroxil were equally effective at prompt resolution of symptoms of group A streptococcal pharyngitis, yet a month later the relapse rate was 37 percent for those treated with penicillin compared to four percent for those treated with cefadroxil.[492]

B. GROUP B STREPTOCOCCI INFECTIONS (*S. agalactiae*)

During the 1970's, group B streptococci came to be recognized as a major cause of neonatal sepsis and meningitis. Maternal postpartum infections can include endometritis and bacteremia. Less well-appreciated is its tendency to become an opportunistic pathogen in adults with diabetes mellitus, malignant tumors, chronic renal failure, and other debilitating conditions. Syndromes in such patients include endocarditis, meningitis, pneumonia, pyelonephritis, septic arthritis (which seems especially common), and cellulitis.[495-497]

Penicillin G remains the most cost-effective therapy. The MIC for penicillin is up to ten-fold higher for group B streptococci as compared to group A streptococci, and the inoculum effect is common. Therefore, high-dose penicillin G is recommended for serious adult infections. For neonatal disease, initial therapy with ampicillin and gentamicin has been recommended because of demonstrated synergism against group B streptococci and also because of the need to provide coverage against other potential pathogens.

C. ENTEROCOCCAL INFECTIONS

Four distinct species of Lancefield group D streptococci are collectively known as enterococci. A major component of the normal intestinal flora, enterococci have relatively little virulence as primary pathogens except in endocarditis and urinary tract infections. Experimentally, it is difficult to cause infection with enterococci alone.[498] However, the relative importance of enterococci in mixed (polymicrobic) infection remains unsettled.

This issue is important for two reasons. First, enterococcal infections are increasing in frequency in hospitalized patients.[499] This may be partly due to wide use of cephalosporin antibiotics since enterococci are notoriously resistant to these agents. Use of potent third-generation cephalosporins especially seems to predispose to enterococcal superinfection, perhaps due to broad suppression of most other components of the normal microbial flora.[500] Second, enterococci are difficult to kill with penicillin or other available antibiotics and optimal therapy often requires the use of two parenteral agents. Administration costs are high even if the drugs themselves (such as penicillin G and gentamicin) are relatively inexpensive.

Enterococci exhibit marked tolerance to penicillin and ampicillin. Although MIC-90 values are approximately 4 mcg/ml, the corresponding minimum bactericidal concentration values (MBC) may exceed 100 mcg/ml. Vancomycin, the only other truly effective antibiotic against enterococci, may likewise tend to be bacteriostatic rather than bactericidal. When killing is necessary (as in endocarditis), it becomes necessary to add an aminoglycoside to concurrent high-dose pen-

icillin G, ampicillin, or vancomycin. Gentamicin has replaced streptomycin as the usual choice, due to frequent resistance of enterococci to streptomycin. The rare occurrence of high-level resistance to gentamicin gives cause for concern.[501]

The need to provide maximum therapy against enterococci in settings other than endocarditis (or the occasional case of meningitis) is unsettled. In many situations, the importance of enterococci is unclear even when isolated from blood. For instance, although enterococcal bacteremia was associated with a 30 percent mortality in one study, it was found that deaths could seldom be attributed directly to these pathogens.[502] Rather, enterococcal isolates seem often to serve as markers of serious illness which may require surgical intervention.

We consider high-dose, continuous infusion penicillin G and intermittent gentamicin to be the most cost-effective therapy for life-threatening enterococcal infections. Streptomycin should be reserved for instances in which susceptibility of enterococci to streptomycin has been demonstrated. The rising incidence of gentamicin resistance makes *in vitro* sensitivity testing mandatory. We recommend ampicillin (or amoxicillin) for enterococcal urinary tract infections, with the caveat that enterococcal bacteriuria often indicates obstructive uropathy. Although enterococci may appear to be susceptible *in vitro* to trimethoprim-sulfamethoxazole,[503] this combination is ineffective clinically.

When enterococci are isolated from wounds or from other sources, polymicrobic infection involving both aerobic and anaerobic pathogens should be suspected. The need for therapy specifically directed against enterococci can be determined only by complete consideration of the entire clinical setting. The combination of an aminoglycoside (e.g., gentamicin) and an antipseudomonal penicillin also provides adequate coverage against enterococci in such situations. Mezlocillin, azlocillin, and perhaps piperacillin may be slightly more active than ticarcillin.[504] However, this type of infection usually requires surgical intervention more than specific therapy directed against enterococci.

D. PNEUMOCOCCAL INFECTIONS

In the previous section, we reviewed the difficulties encountered in proving the diagnosis of pneumococcal infection. We shall now assume that the diagnosis has been established by a characteristic sputum Gram's stain, perhaps confirmed by the Quellung reaction or by blood culture.

In 1964, Austrian and Gold determined the mortality for complicated pneumococcal bacteremia treated with antibiotics to be 24.8 percent.[505] Although penicillin had dramatically lowered overall fatality, the death rate during the first several days of the illness remained unchanged compared to that of the pre-antibiotic era. Recent investigators have reaffirmed this observation despite the introduction of intensive care unit methodology.[506-508] This mortality may be partly explained by early development of the adult respiratory distress syndrome, which may in turn be due to intense accumulation of leukocytes within the lungs.[509] Alcoholic patients with leukopenia have an especially high mortality.[510] These findings help support immunization with pneumococcal polysaccharide for all high-risk patients.[511]

High-level resistance of pneumococci to penicillin G and other antibiotics, such as observed in South Africa,[512] has fortunately not occurred yet in the United States. However, "relative penicillin resistance" (i.e., higher-than-usual MIC's) is not rare. Laboratories should screen for this phenomenon by using a 1-mcg oxacillin disk. In a recent study of pediatric patients, approximately eight percent of blood isolates and 11 percent of CSF isolates were relatively resistant to penicillin with MIC's ranging between 0.15 and 0.5 mcg/ml.[513]

Despite these observations, we continue to recommend procaine penicillin G, 600,000 units intramuscularly twice daily, as the most cost-effective therapy for uncomplicated pneumococcal pneumonia. Cefazolin, 500 mg intramuscularly twice daily, has been shown to be equally effective.[514] For patients with disease of mild to moderate severity, initial therapy can be followed by oral therapy with penicillin V, an oral cephalosporin, or erythromycin. Tetracycline or its congeners should never be used for suspected pneumococcal disease unless the infecting organism has been proven to be susceptible.

High-dose penicillin G therapy (e.g., up to 20 to 24 million units daily) is recommended when meningitis or endocarditis cannot be excluded safely on clinical grounds. The use of such doses has been correlated with sputum colonization by

other potential pathogens.[515] However, previous suggestions that the use of high doses of penicillin or of broad-spectrum agents predisposes to secondary pneumonias caused by opportunistic pathogens have not been confirmed by recent data. Among 167 adult patients with bacteremic pneumococcal pneumonia in Columbia, South Carolina, it was determined that the overall mortality was 24 percent, a figure similar to that previously cited. Patients who received broad spectrum initial therapy had a higher mortality rate, but this finding was explained by the greater severity of their illness compared to patients receiving narrow-spectrum therapy. There was also no excess later mortality.[516]

Historically, low-dose penicillin G therapy of pneumococcal infection stands among the truly great triumphs of medicine. Evaluation of cost-effective treatment of pneumococcal disease would appear to be a useful starting point for physicians and hospitals seeking lower costs of specific antimicrobial therapy.

E. STAPHYLOCOCCUS AUREUS

1. *Changing Susceptibility Patterns*

Infections due to *S. aureus* remain among the most common encountered in the daily practice of both outpatient and inpatient medicine. There is a general impression that hospital-acquired *S. aureus* infections are again increasing in frequency. Among the familiar syndromes of infection caused by this versatile pathogen,[517] the occasional occurrence of overwhelming sepsis deserves special emphasis.

Most laboratories now find that fewer than 10 percent of strains of *S. aureus* are sensitive to penicillin G. Even in outpatient medicine, susceptibility to penicillin is so unusual that the physician should automatically request (or the laboratory produce) results of beta-lactamase studies to confirm true susceptibility.

Staphylococci exhibit three kinds of resistance to penicillin G: destruction of penicillin by beta-lactamase production; tolerance (see section III); and "intrinsic resistance."[518] "Intrinsic resistance" appears to be the major explanation for methicillin-resistant *S. aureus* (MRSA), an increasingly important clinical problem.

Once observed mainly in Europe, MRSA now threatens to become a major scourge of American hospitals. As might be expected, initial recognition and spread of MRSA has occurred mainly in large teaching hospitals with over 600 beds.[519] However, it does not require undue pessimism to fear that MRSA strains may eventually "take over" just as penicillinase-producing strains did during the 1940's and 1950's. In Detroit, Michigan, where cephalexin (Keflex) is available as a street drug among the addict population, community-acquired MRSA isolates are now common.[520] Could this be a harbinger of things to come?

Definitive therapy of *S. aureus* disease is now considered in terms of methicillin-sensitive and methicillin-resistant strains. From a practical viewpoint, physicians in community hospitals should consider *S. aureus* resistant to penicillin yet still sensitive to antistaphylococcal penicillins and cephalosporins until the results of definitive susceptibility testing are available.

2. *Therapy of Methicillin-sensitive* S. *aureus Infections*

The gold standard for parenteral therapy has been nafcillin or oxacillin (methicillin having an unacceptable incidence of nephritis when used for longer than two weeks). However, these agents are expensive.

We now recommend first generation cephalosporins as the most cost effective therapy for the majority of patients. For pharmacokinetic reasons noted previously, cefazolin (one to two grams every eight hours) is the best buy.

If central nervous system infection is suspected, high-dose (12 grams per day) nafcillin is preferable to first-generation cephalosporins since the latter agents cross the blood-brain barrier poorly, if at all. There have been anecdotal reports of failure of cefazolin therapy in staphylococcal endocarditis,[521] which may be due to the somewhat greater susceptibility of cefazolin to staphylococcal beta-lactamases compared to other agents. However, we and others have used cefazolin successfully for this indication.

Although cefamandole has been widely recommended for staphylococcal infections, we are unaware of any clinical evidence that this more expensive agent is superior to cefazolin. Many other regimens for parenteral therapy, such as clindamycin, TMP/SMX, and vancomycin can be effective but are usually more expensive and/or associated with less clinical experience. As noted previously, the notion that vancomycin is the "most powerful" agent against methicillin-sen-

sitive *S. aureus* strain should be dispelled. Erythromycin can be used for mild to moderate infection. However, some strains of staphylococci show resistance to erythromycin and most authorities would not recommend erythromycin as a first-line drug.

Optimum oral therapy for penicillin-resistant, methicillin-sensitive strains can be exceedingly expensive. Dicloxacillin is widely considered to be the best of the agents available in this country. However, dicloxacillin is expensive (Section IV), and if not dosed with careful attention to meals can be ineffective (the presence of food markedly impairs absorption). Oral cephalosporins such as cephalexin (Keflex) have been widely and successfully used, but serum inhibitory activity against *S. aureus* is usually marginal.[522] Erythromycin may still be useful for mild infections, but we would not rely on that agent for serious *S. aureus* disease. The potential role of the amoxicillin-clavulanic acid combination and of oral TMP/SMX awaits further clinical experience.

3. *Therapy of Infections Due to Methicillin-resistant* S. *aureus (beta-lactam-resistant* S. *aureus)*

It is crucial that a hospital microbiology laboratory can recognize MRSA. These strains are "heteroresistant" in the sense that cultures typically contain two populations — one methicillin-sensitive and the other methicillin-resistant. Since the methicillin-sensitive population usually grows more rapidly, the laboratory may mistakenly report the isolate as being sensitive when in fact a large proportion of microorganisms are methicillin-resistant. Although methicillin-resistant strains are still uncommon at most small community hospitals, one should make sure that the laboratory maintains a high level of awareness of this possibility.[523, 524]

MRSA isolates may be susceptible *in vitro* to a number of antibiotics including the cephalosporins. Clinically, however, it is proper to refer to these isolates as "beta-lactam-resistant." Most experience has been that agents other than vancomycin are clinically ineffective irrespective of *in vitro* susceptibility test results.[525, 526] There is no satisfactory agent for oral therapy of MRSA infections, although TMP/SMX and rifampin have been used to eradicate the nasal carriage state. The therapeutic difficulties posed by these staphylococcal strains underscore the importance of epidemiologic measures designed to limit spread.[527]

4. *Use of Two or More Drugs for* S. *aureus Infections*

Synergism between cell wall-active antibiotics (beta-lactam agents or vancomycin) and aminoglycosides can be documented against most *S. aureus* isolates both *in vitro* and in experimental models of infection. Synergism between cell wall-active antibiotics and rifampin is less predictable. Whether more than one drug should be used clinically is controversial.

It seems reasonable to use two-drug therapy for the uncommon problem of *S. aureus* meningitis, due to the sometimes-marginal penetration of beta-lactam agents and also of vancomycin into the CSF.[528] For endocarditis, combination therapy has yet to be proven more effective than use of a single drug. However, initial dual agent therapy seems reasonable for seriously-ill patients and also for those who fail to respond to one drug.[529]

Beam demonstrated that patients with staphylococcal arthritis may fail to respond to beta-lactam agents because of sequestration of microorganisms within phagocytic cells. Use of rifampin, which penetrates phagocytic cells, proved curative.[530] This phenomenon is probably more widespread than currently recognized, but definitive guidelines are lacking. Current interest involves especially the use of rifampin in staphylococcal osteomyelitis.[531] Rifampin should not be used routinely for staphylococcal infections for two reasons. First, wide use of rifampin would lead to rapid emergence of resistance. Second, placebo-controlled trials indicate the addition of rifampin to be unnecessary except in the most seriously ill patients.[532]

5. *Duration of Therapy*

The duration of therapy necessary for *S. aureus* infections varies strikingly. On the one hand, subcutaneous abcesses may require only incision and drainage with no antimicrobial therapy. On the other hand, chronic osteomyelitis may require six or more months of therapy. Guidelines are again difficult to formulate.

The patient with *S. aureus* bacteremia presents the problem of whether to treat for four to six weeks as though endocarditis were present. It was once said that endocarditis complicated as many as 20 to 70 percent of cases of staphylococcal

bacteremia. This figure has now been revised downwards. In Columbia, South Carolina, it was determined that 9.7 percent of community-acquired *S. aureus* bacteremias and 1.7 percent of hospital-acquired *S. aureus* bacteremias were complicated by recognized endocarditis.[533]

The commercially-available teichoic acid antibody test offers some assistance in that patients with endocarditis typically show a rising titer, whereas patients experiencing only a short-lived bacteremia without deep tissue infection show no such rise.[534] However, overall usefulness of this test is debatable. The possibility of endocarditis should always be considered, especially in the absence of an obvious source for bacteremia. In doubtful situations, one strategy is to combine a ten to fourteen day course of parenteral therapy with a subsequent course of a monitored oral regimen. The present authors differ regarding the advisability of such a strategy; one of us favors such a program in good-risk patients, whereas another author prefers the "either/or" alternative of seven to fourteen days' therapy for bacteremia versus four to six-weeks' therapy for endocarditis.

F. COAGULASE-NEGATIVE STAPHYLOCOCCI

1. A Diverse Group of Microorganisms

Once ignored as a cause of infection in most circumstances, the coagulase-negative staphylococci now occupy a prominent niche as true pathogens. They are well recognized causes of serious infection among compromised hosts, including patients with foreign bodies (especially vascular access devices and prosthetic implants).[535] Bloodstream infections are being recognized with increasing frequency.[536-539]

Although we tend to equate "coagulase-negative staphylococci" with "*S. epidermidis*," this is an oversimplification. This group of organisms is extremely diverse. Numerous typing schemes are available.[540] Species other than *S. epidermidis* include *S. saprophyticus, S. capitis, S. warneri, S. hominis, S. haemolyticus, S. xylosus, S. cohnii*, and *S. simulans*. *S. saprophyticus* may be a common cause of urinary tract infection in otherwise healthy women,[541] but the other species seem to cause no truly distinctive syndromes.

2. Deciding When to Treat

Contamination of cultures by coagulase-negative staphylococci is common, and it is often difficult to determine whether isolates are clinically significant. In recent studies, only six to 15 percent of blood isolates were considered to be significant.[345, 542] The finding of multiple isolates often makes the best case for embarking upon therapy. It may be useful to ask the laboratory to save isolates of doubtful significance and to have antibiotic susceptibility testing and biotyping carried out. If separate isolates from the same patient have the same antibiotic susceptibility pattern and biotype, the odds are increased that these isolates in fact represent the same strain and may therefore be clinically significant.[543] While judgment is necessary in the last analysis, many observers believe that the true incidence of serious coagulase-negative staphylococcal infection is increasing.

3. Choice of Agents

In general, coagulase-negative staphylococci are more resistant to antibiotics than are their coagulase-positive counterparts. They exhibit a bewildering array of antibiogram patterns. Therapy should follow most of the guidelines outlined above for coagulase-positive staphylococci. Sensitivity to penicillin should be confirmed by testing for the ability to produce beta-lactamase. Methicillin-resistant isolates should be regarded as being resistant to all beta-lactam agents; the cephalosporins are unlikely to be effective despite activity *in vitro*. Finally, use of two or even three drugs may be necessary in difficult situations. Especially when foreign implants are present, these microorganisms challenge our efforts to contain costs.

G. LISTERIA MONOCYTOGENES

Listeria is an important cause of sepsis and meningitis especially in neonates, the elderly, and the immunocompromised.

Optimum choice and duration of therapy are unclear, but penicillin G or ampicillin is generally recommended. Both choices find strong advocates, yet both have been associated with therapeutic failure.[544] In our opinion, high-dose penicillin G by continuous infusion is the most cost-effective choice. Chloramphenicol does not seem to be effective as an alternative agent for *Listeria* meningitis,[545] and it is important to note also that chloramphenicol antagonizes the rather

slow bactericidal action of penicillins. Cephalosporins, including the newer ones, have little or no activity against *Listeria*, but at least have the virtue of not antagonizing the activity of penicillins.[546]

H. HEMOPHILUS INFLUENZAE

Invasive disease due to *H. influenzae* occurs in approximately one in every 200 children between the ages of three months and five years. Although the mortality from *H. influenzae* meningitis has been reduced to about five percent, morbid residua including deafness and mental retardation remain relatively common. Prevention of invasive disease in children is a major public health priority. This pathogen also causes a spectrum of adult syndromes including febrile tracheobronchitis, pneumonia, epiglottitis, meningitis, and arthritis.[547-549]

Although nontypeable strains of *H. influenzae* may be especially significant in persons with underlying lung disease and in the elderly,[550] most of the debate concerning optimum therapy revolves around the encapsulated types and especially type b. Up to 25 percent of type b isolates now produce beta-lactamase. Therefore, chloramphenicol has been recommended for initial therapy of life-threatening disease until or unless true ampicillin sensitivity (and absence of beta-lactamase production) can be confirmed. The American Academy of Pediatrics has recommended that ampicillin and chloramphenicol be given concomitantly until sensitivity tests are available.

As previously noted, the newer cephalosporins appear to be extremely promising and may eventually replace chloramphenicol (or chloramphenicol/ampicillin) for initial therapy. For systemic therapy, cefuroxime is now considered to be the drug of choice by some authorities. The third-generation cephalosporins are similarly active but more expensive. *H. influenzae* exhibits a marked inoculum effect, and this phenomenon may apply especially to beta-lactamase-producing strains.[551] This effect may apply not only to older drugs such as ampicillin and cefamandole but also to newer agents including cefoperazone.[552]

Oral therapy is a reasonable alternative for less severe *H. influenzae* infections. The amoxicillin/clavulanic acid combination (Augmentin) appears to be especially promising.[553] Other alternatives include oral cephalosporins such as cefaclor and TMP/SMX. Ampicillin (or amoxicillin) remains the most cost-effective choice for susceptible, beta-lactamase-negative isolates.

Remarkably, systemic parenteral therapy of invasive *H. influenzae* infection with ampicillin or chloramphenicol does not eradicate the carrier state. Therefore, it is recommended that patients be treated additionally with rifampin prior to discharge from the hospital in order to prevent secondary cases.[554] It is worth emphasizing that such secondary cases include not only meningitis and other syndromes in children, but also serious infections such as acute epiglottitis in adults.[555]

I. NEISSERIA MENINGITIDIS

Since its cousin, the gonococcus, has acquired plasmids that enable it to make beta-lactamases, one might have predicted that meningococci would eventually do the same. Meningococci seldom carry plasmids, but laboratory transfer of penicillinase-producing plasmids from gonococci to meningococci has now been demonstrated.[556] Fortunately, clinical isolates of meningococci remain exquisitely sensitive to penicillin G. High-dose, continous infusion penicillin G remains our recommendation for cost-effective therapy. Chloramphenicol and some third-generation cephalosporins are effective although more costly alternatives.

As with *H. influenzae*, therapy with high-dose penicillin or chloramphenicol does not eradicate the carrier state. Therefore, rifampin therapy prior to discharge from the hospital (or a sulfonamide for strains proven to be susceptible) appears necessary in order to prevent secondary cases.[557] Although a single dose of intramuscular ceftriaxone has also been shown to eradicate the carrier state,[558] this would be more expensive than rifampin.

J. NEISSERIA GONORRHOAEAE

The gonococcus provides yet another example of continued evolution of antimicrobial therapy brought about by the opposing factors of emergence of drug resistance and development of still-newer antibiotics.

The epidemic of gonococcal disease in the United States peaked in 1975 and has since declined. This decline was offset by the recognition in 1976 of imported strains of plasmid-bearing, penicillinase-producing *Neisseria gonorrhoaeae* (PPNG). These strains are currently rare in the

United States (about 0.5 percent of isolates) and are especially rare in South Carolina.[559] A second type of resistance is chromosomally-mediated and results in strains with high MIC's of penicillin G and often to tetracycline as well. In Asia and Africa, strains requiring at least 2 mcg/ml of penicillin for inhibition now rival PPNG strains as causes of treatment failure, and such high-level resistance is now being recognized in this country as well.[560]

Recommendations for gonococcal therapy must take into account the disease syndrome being treated and whether drug resistance of either type is present in the area. The cost of some recommended regimens[560-562] is shown in Table 46. Gonococcal pelvic inflammatory disease is usually polymicrobial, since the damage to Fallopian tube epithelium allows secondary invasion by vaginal anaerobic and aerobic bacteria, *Chlamydia trachomatis*, and *Mycoplasma hominis*. Regimens for pelvic inflammatory disease were considered in the previous section (Table 44).

In South Carolina, the preferred regimen at present for uncomplicated gonorrhea in heterosexual patients continues to be a single large oral dose of either ampicillin or amoxicillin combined with one gram of probenecid. In homosexual patients, intramuscular procaine penicillin G and probenecid is standard therapy since the oral regimens are ineffective for pharyngeal and anorectal disease. Unfortunately, neither regimen is reliable for *Chlamydia trachomatis* which is present as a coinfection in 20 to 45 percent of patients. This, then, requires additional therapy with tetracycline or doxycycline for seven days. Be-

TABLE 46. COST OF SOME CURRENT REGIMENS FOR GONORRHEA*

Regimen	Indication**	Cost
Amoxicillin, 3.0 g PO plus probenecid, 1.0 g PO	1 (A)	$ 2.33
Ampicillin, 3.5 g PO plus probenecid, 1.0 g PO	1 (A)	1.75
Procaine penicillin G, 4.8 m.u. IM plus probenecid, 1.0 g PO	1,2 (A)	10.91
Spectinomycin, 2 g IM	1,2 (A,B)§	10.04
Ceftriaxone, 125 mg IM	1,2 (A,B)	4.35
Ceftriaxone, 250 mg IM	1,2 (A,B)	8.70
Cefotaxime, 1.0 g IM plus probenecid, 1.0 g PO	1 (B)	9.75
Cefoxitin, 2.0 g IM plus probenecid, 1.0 g PO	1 (B)	8.28
Crystalline (aqueous) penicillin G 2.5 m.u. IV q6h for three days or until the patient improves followed by ampicillin, 500 mg PO q.i.d. to complete a seven day course	3 (A)	79.09
Amoxicillin, 3.0 g PO plus probenecid 1.0 g PO followed by amoxicillin, 500 mg p.o. t.i.d. to complete a seven day course¶	3 (A)	8.82
Cefoxitin, 1.0 g IV q6h for seven days	3 (A,B)	363.02
Cefotaxime, 500 mg IV q6h for seven days	3 (A,B)	272.16
Ceftriaxone, 1.0 g IV daily for seven days	3 (A,B)	227.78

*These regimens are derived from several sources but primarily reflect those given in the most recent CDC guidelines (Morbidity and Mortality Weekly Report, 34: 4S (October 18, 1985 supplement issue, "1985 STD Treatment Guidelines", which provide information regarding the many subtleties of this infection. Therapy should usually include a seven-day course of tetracycline, 500 mg PO q.i.d., doxycycline, 100 mg PO b.i.d., or (for pregnant patients or those unable to tolerate tetracycline) erythromycin. Costs are based on average wholesale prices, January 1986.

**Indications are coded here as follows: 1 = uncomplicated gonorrhea; 2 = anorectal or pharyngeal gonorrhea; 3 = disseminated gonococcal infection; A = use in areas where gonococci remain penicillin-sensitive and fewer than one percent of isolates produce penicillinase; B = use in areas in which chromosomal reistance to antibiotics results in cure rates below 95 percent with group A regimens or in which penicillinase-producing strains are prevalent.

§Spectinomycin is not recommended for pharyngeal gonorrhea.

cause of increasing resistance, tetracycline alone is no longer recommended for therapy of gonorrhea.

Spectinomycin, two grams intramuscularly, has been the standard alternative therapy for patients infected with resistant strains. Many of the newer cephalosporins such as cefoxitin, cefuroxime, and the third-generation agents are highly active even against penicillin-resistant strains. There is considerable experience with cefoxitin, which has the additional advantage of providing excellent anaerobic therapy for pelvic inflammatory disease. The higher cost of both spectinomycin and of the newer cephalosporins, combined with the lack of extensive evaluations for efficacy against incubating syphilis, make the conventional regimens the standard for most patients.

Ceftriaxone appears to be a welcome addition to our armamentarium against the gonococcus. Highly effective *in vitro* and with a long serum half-life, ceftriaxone as a single 125 mg (0.5 cc) dose has cured up to 100 percent of cases of uncomplicated gonorrhea in initial studies. In one study, ceftriaxone even cured 94 percent of 32 patients with gonococcal pharyngitis (which is especially difficult to treat and if you've read this far, you realize that eradication of most organisms from the pharynx is surprisingly difficult!) and 100 percent of 52 patients with gonococcal proctitis.[563] Aztreonam[564] and norfloxacin[565] are among the other new agents which appear promising. Trimethoprim-sulfamethoxazole (TMP/SMX) has been shown to be effective for gonococcal infections but its role in therapy is poorly defined at present.

K. ENTEROBACTERIACAE

1. General Aspects

Since there are many species of these commonly-occurring aerobic gram-negative rods, and also since there are many associated disease syndromes, generalizations about cost-effective therapy are hazardous. Both the emergence of drug resistance and the introduction of new agents force us to re-examine our standard regimens. Again, our considerations must include MIC values, pharmacokinetics, clinical experience, and the merits of oral versus parenteral administration. An important issue for inpatient therapy concerns the relative roles of newer beta-lactam antibiotics versus the aminoglycosides. Earlier (Table 23), we determined "how much drug one gets for the money" on the basis of microbiologic data and pharmacologic data and average wholesale prices (January 1986).

A similar analysis of "daily kill per dollar" for first, second, and third generation cephalosporins is shown in Table 47. Although newer agents such as cefotaxime, ceftizoxime, and ceftriaxone are more expensive than the older ones, note that they actually provide "more drug for the money" compared to either the older cephalosporins or the aminoglycosides. This is the case because of the exceedingly low MIC-90 values of these agents. Among the newer cephalosporins shown in Table 47, ceftizoxime and ceftriaxone would appear to be the most cost-effective (for comparison, it should be remembered that ceftriaxone is highly protein bound). Cefoperazone would appear to be the least cost-effective against the Enterobacteriaceae (the advantage of cefoperazone being its better activity against *Pseudomonas aeruginosa*). These calculations should not be interpreted as a broad endorsement for the newer agents. For most patients, the greater therapeutic ratios (serum concentrations to MIC values) provided by the newer agents represent overkill.

2. E. coli

E. coli continues to be the most common cause of urinary tract infection (Section VIII). Community-acquired strains sensitive to all antibiotics ("pan-sensitive") can be successfully treated with numerous agents. Hospital-associated strains and in some localities community-acquired strains as well tend to be more frequently susceptible to first-generation cephalosporins (such as cefazolin) than to ampicillin. Hospital-acquired strains are usually exquisitely susceptible to the third-generation cephalosporins. These agents are the drugs of choice for *E. coli* meningitis and rival the aminoglycosides for therapy of deep tissue infections such as pneumonia, liver abscess, cholecystitis, and mixed aerobic-anaerobic "surgical" infections.

3. Klebsiella-Enterobacter-Serratia

The members of the "KES" group are notorious for their ability to acquire drug resistance. Highly resistant microorganisms have caused nosocomial infection outbreaks in South Carolina, as elsewhere.

TABLE 47. COST-EFFECTIVENESS OF SOME OLDER AND NEWER CEPHALOSPORINS AGAINST VARIOUS ENTEROBACTERIACEAE, MEASURED AS "DAILY KILL PER DOLLAR"*

Antibiotic	E. coli	Klebsiella pneumoniae	Proteus mirabilis	Enterobacter aerogenes	Serratia marcescens
Cephalothin	0.08	0.17	0.52	< 0.001	< 0.001
Cefazolin	0.40	0.81	0.81	< 0.001	< 0.001
Cefamandole	0.14	0.28	0.36	< 0.001	< 0.001
Cefoxitin	0.17	0.17	0.35	< 0.001	0.02
Cefotaxime	3.42	3.42	8.4	4.27	2.14
Cefoperazone	0.13	0.13	2.07	1.03	0.13
Ceftizoxime	6.66	6.66	16.65	8.32	0.83
Ceftriaxone	18.34	18.34	91.71	22.92	1.15

*Calculations based on the formula shown in section IV and in Table 23, using peak serum levels from Table 7, MIC-90 values from Table 5, and daily costs from Table 11.

Klebsiella readily colonizes the intestinal tracts of hospitalized patients, and thus becomes a frequent and serious nosocomial pathogen. Aminoglycosides have been the mainstay for therapy of serious *Klebsiella* infections. There has been debate whether clinically-relevant synergism occurs between the aminoglycosides and the older cephalosporins. The MIC's for third-generation cephalosporins against *Klebsiella* isolates are usually quite low, and these agents seem to be replacing the aminoglycosides as first-line therapy of serious infections.

The incidence of infections due to *Enterobacter* seems to be increasing,[566, 567] perhaps in part due to the characteristic resistance of these strains to the older cephalosporins. High-level resistance to even third-generation cephalosporins can occur among *Enterobacter cloacae* strains. This resistance may be due both to production of beta-lactamases (destruction of drug in the periplasmic space) and to critical alteration of membrane proteins (diminished penetration of drugs into the cell wall).[568, 569] That resistance to any of the beta-lactam agents can develop during therapy should be remembered when treating *Enterobacter* infections. The aminoglycosides will retain their importance in our arsenal against the *Enterobacter* species.

Compared to *Klebsiella* and *Enterobacter*, *Serratia* species are usually less invasive. Once considered so harmless that they were used as "marker" organisms for clinical experiments, they have gained a reputation as important nosocomial pathogens. Resistance to aminoglycosides has been an important problem here in South Carolina[570] as elsewhere. In our opinion, the aminoglycosides continue to be the most useful drugs against *Serratia*. Gentamicin is usually somewhat more active than tobramycin against *Serratia* and is therefore the cost-effective choice. Both newer cephalosporins and also TMP/SMX have a role in these infections, but their status relative to the aminoglycosides as cost-effective agents remains somewhat unclear.

4. Salmonella

The *Salmonella* species provide perhaps the best example of the clinical failure of numerous drugs despite excellent *in vitro* activity. This is partly due to inadequate entry of many agents into phagocytic cells, to which these organisms readily adapt. In addition to this problem, widespread use of antibiotics in other parts of the world has led to *Salmonella* strains resistant to all three of the most useful agents (ampicillin, chloramphenicol, and TMP/SMX).[571] For these reasons, therapy of salmonellosis continues to pose major problems.

Maximum antibiotic therapy with ampicillin or chloramphenicol is of course necessary for severe typhoid fever and recent data indicate that corticosteroids are a useful adjunct.[572, 573] Opinions about the efficacy of TMP/SMX have been mixed. Experience with older cephalosporins has been disappointing, but newer cephalosporins may have a role. Ceftriaxone appears to be es-

pecially promising.

Traditionally, antibiotic therapy has not been recommended for salmonella gastroenteritis, as this disorder is usually self-limited and therapy might prolong the convalescent carrier state. Three exceptions should be noted: (1) patients in whom an enteric fever syndrome seems to be evolving; (2) patients in developed countries with a prolonged carrier state (according to some authorities); and (3) older persons with vascular disease. By colonization of arteriosclerotic plaques, transient *Salmonella* bacteremia can produce disastrous mycotic aneurysms. This occasional occurrence prompts us to recommend therapy for elderly persons likely to have significant arteriosclerosis of the aorta.[575, 576]

5. Shigella

Shigellosis occasionally results in bacteremia,[577] but usually resolves spontaneously. Therapy notoriously promotes drug resistance among the *Shigella* species; whether to give antibiotics therefore has been controversial. However, current consensus is that antibiotics are in fact indicated and that TMP/SMX is the therapy of choice.[578] The role of newer agents such as ciprofloxacin (Table 41) needs clarification.

6. Other Enterobacteriaceae

Community-acquired *Proteus mirabilis* infections can usually be approached much the same as community-acquired *E. coli* infections with the caveat that *Proteus mirabilis* bacteriuria can be a sentinel indication of renal, ureteral, or bladder calculi. Choice of therapy against less common isolates such as *Providencia, Morganella, Citrobacter,* and *Erwinia* species should usually be based on the results of *in vitro* susceptibility data. *Edwardsiella* is usually susceptible to the antibiotics effective against more common isolates such as *E. coli*.[579] Optimum therapy against *Yersinia* infections other than plague is not well-defined.[580]

L. PSEUDOMONAS AERUGINOSA

1. Overview — One Drug or Two?

Although the incidence of *Pseudomonas aeruginosa* infection in some major medical centers has declined during the last decade, this organism continues to be a common pathogen causing serious infections. Its reputation as the quintessential opportunistic pathogen among patients suffering from burn wounds, cystic fibrosis, acute leukemia, granulocytopenia of any origin, or extensive trauma remains unchallenged. It is the usual cause of malignant otitis externa in diabetic patients and occasionally causes other deep infections such as endophthalmitis, endocarditis, and meningitis.[581, 582] Notoriously able to survive in water, it has been associated with dermatitis, folliculitis, urinary tract infection and even pneumonia among whirlpool and spa bathers.[583-586]

Although most clinicians favor the use of two antibiotics (an aminoglycoside plus an antipseudomonal beta-lactam agent) for therapy of *Pseudomonas* infections outside the urinary tract, documentation of the need for combination therapy remains scanty. Experimental evidence is conflicting.[587, 588] Nevertheless, there is growing evidence that combination therapy is superior to single agent therapy for invasive infections in severely compromised patients.[589] The value of dual drug therapy in other situations is unclear, and such therapy adds greatly to cost.

Pseudomonas aeruginosa infections frequently involve tissues made ischemic by underlying diseases. Compounding the problem, the organism invades blood vessels, causing infarction of tissues. Delivery of adequate concentrations of drug to such ischemic tissues may be a significant problem. The MIC's of aminoglycoside and other antibiotics against this pathogen are typically quite high, although often clinically attainable (Table 6). Resistance to beta-lactam antibiotics tends to develop rapidly when these agents are used alone for *Pseudomonas* infection outside of the urinary tract. Therefore, the aminoglycosides continue to be a mainstay of therapy. The need to use two drugs in other situations is less well-defined.

Although there is little or no statistical evidence that tobramycin is clinically superior to gentamicin, we regard tobramycin as the aminoglycoside of choice for most patients because it is usually about twice as active as gentamicin. Therapy of *Pseudomonas aeruginosa* infections is one of the few instances in which we advocate frequent documentation of adequate peak blood levels, since serum levels of 8 to 10 mcg/ml may be necessary. Amikacin is less active than tobramycin on a weight basis, but its higher achievable safe blood levels make it probably at least as effective as tobramycin. However, amikacin is slightly more expensive, serum assays

are less readily available at most clinical laboratories within South Carolina, and published experience is less compared to tobramycin.

The relative merits of the various antipseudomonal penicillins and cephalosporins were reviewed earlier in Section V. A large body of literature deals with a search for the most efficacious, synergistic combination of drugs but no consensus has been reached. Some authorities consider the most effective combination *in vitro* to be amikacin and azlocillin. This combination is more expensive than the customary regimen of tobramycin and ticarcillin. Some of the new oxyquinolone derivatives have activity against *Pseudomonas* and may prove to be useful in selected patients.

2. *Urinary Tract Infections*

Pseudomonas urinary tract infections nearly always result from obstructive uropathy or Foley catheterization. Aggressive early therapy is essential in male patients due to the potential for development of *Pseudomonas* prostatitis — an infection which is difficult or even impossible to eradicate with current drugs.

In the absence of renal failure, all of the current antipseudomonal agents are concentrated in urine. Therefore, the most cost-effective approach to *Pseudomonas* urinary infection often consists of intramuscular injections of these agents or even oral therapy with carbenicillin indanyl sodium (Geocillin). It should be remembered that serum levels obtained with the oral carbenicillin preparation are too low for therapy of any *Pseudomonas* infection outside the urinary tract. *Pseudomonas aeruginosa* may appear to be susceptible to TMP/SMX *in vitro*, but this combination agent does not seem to be clinically effective.

In the presence of oliguric renal failure, treatment of *Pseudomonas aeruginosa* urinary infection can be extremely difficult. Inhibitory quotients (urine concentrations divided by MIC's) are marginal. Alkalinization of the urine enhances the activity of aminoglycoside antibiotics and may be of value in selected patients.

3. *Nail Puncture Wound-related Osteomyelitis*

It is surprising that *Pseudomonas aeruginosa* osteomyelitis due to nail puncture wounds of the feet was not described until 1968,[590] since we now recognize that *Pseudomonas* accounts for 90 to 95 percent of cases of this relatively common syndrome.[591] Since only about 10 percent of nail puncture wounds result in soft tissue infections, and since actual osteomyelitis is even less common (approximately 1.5 percent), it is not surprising that diagnosis is almost invariably delayed.

Several considerations temper our choice of cost-effective therapy: (1) maximum antipseudomonal therapy is extremely expensive; (2) customary duration of therapy for acute osteomyelitis is often stated to be six weeks; (3) the tendency for inadequately-treated osteomyelitis to relapse is well-known; yet (4) patients with this syndrome are often school-aged children, construction workers, or the barefooted poor.

Three weeks of therapy have been recommended by many authors. Jacobs et al. suggested that only 10 to 14 days of therapy after debridement suffices for children with *Pseudomonas* osteochondritis.[592] Crosby and Powell suggested close monitoring of the sedimentation rate, and that antibiotics should not be discontinued unless the sedimentation rate is falling by approximately one millimeter/hour per day.[591] However, we have seen relapse in a patient treated for four weeks with tobramycin and an antipseudomonal penicillin.

In our opinion, this is a situation in which home ambulatory outpatient therapy with intravenous tobramycin alone for a more extended period might actually be the most cost-effective approach. Newer cephalosporins such as ceftazidime may prove to be useful. The recent finding that ciprofloxacin is effective for experimental *Pseudomonas* osteomyelitis raises the exciting possibility that the new oxyquinolones, which might even be given orally, could be useful in selected cases.[593]

4. *Sepsis in Neutropenic Patients and Special Deep Tissue Infections*

Two-drug therapy should be given to neutropenic cancer patients with proven infection due to *Pseudomonas aeruginosa*. Bodey and colleagues recently demonstrated a dramatic difference in outcome between patients who received an antipseudomonal beta-lactam agent, alone or with an aminoglycoside, compared to patients who received an aminoglycoside alone.[589] Experimental studies of *Pseudomonas* infections in the presence of neutropenia suggest that the aminoglycosides will continue to be essential.[594]

The introduction of antipseudomonal beta-lac-

tam agents appears to have had a dramatic effect on mortality due to malignant otitis externa, a typically insidious and destructive infection almost unique to diabetic patients.[595, 596] Again, two-drug therapy is indicated.

Unique pharmacologic problems in patients with cystic fibrosis were mentioned in Section III. A current grim summary is that "once established, this organism is never eradicated completely from the lungs of CF patients, and persists until pulmonary failure and death."[597] Better insight into the disease, rather than still-newer antibiotics, may eventually prove to be the best answer.

M. ACINETOBACTER CALCOACETICUS

There are no clinically-important differences between the two subspecies of this small, pleomorphic, aerobic gram-negative coccobacillus previously known as *Mima* and *Herellea*. Although occasionally causing community-acquired infection, particularly pneumonia, *Acinetobacter* is best-known as an opportunistic nosocomial pathogen. The occurrence of *Acinetobacter* among critically-ill patients appears to be increasing,[598, 599] and at some centers more than one-half of isolates are resistant to aminoglycosides.

Recommended therapy for serious *Acinetobacter* infections is the same as that used for *Pseudomonas aeruginosa:* an aminoglycoside (if susceptible *in vitro*) plus an antipseudomonal penicillin. For less serious infections, an aminoglycoside alone would be cost-effective. These organisms tend to be resistant to the newer cephalosporins and — like enterococci — may cause superinfections in patients receiving those agents. Whether newer agents such as imipenem may have a role in *Acinetobacter* infections is being investigated.[600]

N. LEGIONELLA PNEUMOPHILA

Many experimental and clinical studies now support the conclusion drawn from the 1976 Philadelphia outbreak: patients with legionnaire's disease do better when treated with erythromycin. Cost-effectiveness issues include both the necessity and duration of intravenous as compared to oral therapy and also the total duration of such therapy. Response to treatment may be slow. Many prefer to give high-dose (three to four grams per day) intravenous erythromycin for at least a week, followed by oral therapy for two additional weeks.

Like erythromycin, rifampin is active against *L. pneumophila* and is concentrated within macrophages. Although rifampin should not be used alone due to the potential for rapid development of resistance, there is experimental support (but little published experience) for use of both rifampin and erythromycin for serious infections due to this intracellular pathogen.[601] Theoretical reasons for such combination therapy include more rapid killing and possible coverage against erythromycin-resistant strains.[602] Other antibiotics including tetracyclines and various beta-lactams[603] are active against *Legionella* but are not recognized to be first-choice agents.

O. SOME MISCELLANEOUS AEROBIC GRAM-NEGATIVE ORGANISMS

1. Branhamella catarrhalis

This organism formerly stood among the allegedly non-pathogenic *Neisseria* species of the normal oral flora. A number of studies now show it to be an important cause of otitis media and sinusitis in children and of bronchitis and even pneumonia in persons with underlying chronic lung disease. It is also considered to be a possible cause of chronic cough in children and acute laryngitis in adults. It occasionally causes life-threatening infections such as meningitis and endocarditis.

Up to 83 percent of *B. catarrhalis* isolates produce beta-lactamases,[604] making ampicillin therapy ineffective. The older cephalosporins are only moderately active. The amoxicillin-clavulanic acid combination (Augmentin) has been used successfully for lower respiratory infections[553] and is our choice for outpatients. Newer cephalosporins and antipseudomonal penicillins usually have excellent *in vitro* activity against this organism,[604, 605] but their role in therapy needs clarification.

2. Campylobacter Species

Three species of these comma-shaped organisms are recognized. *C. jejuni* is by far the most frequently-encountered and typically causes a self-limited syndrome of diarrhea, fever, and crampy abdominal pain.[606] Severe colitis can occur. Two fatalities, including a young adult, were recently reported; both patients had taken an antimotility agent (Lomotil).[607] *C. coli* is much

less common and produces a similar syndrome. *C. fetus* subspecies *fetus* differs in that it is rarely isolated from stool but causes bacteremia and fever in immunocompromised patients.

Erythromycin is highly active against *C. jejuni* and seems to shorten the illness duration.[608] Whether specific therapy is really needed in the majority of patients seems questionable. Ciprofloxacin, unlike erythromycin, is active against *C. coli* as well[609] (Table 41) and may become a therapeutic alternative. The occasional patient with systemic infection due to *C. fetus* should receive parenteral antibiotics; either gentamicin or chloramphenicol is currently recommended.

3. *Aeromonas hydrophila*

We have occasionally encountered this organism as a cause of severe cellulitis resulting from wounds contaminated with fresh water. It is also recognized as a cause of diarrhea[610, 611] and of sepsis among patients with cancer.[612]

Gentamicin is the most cost-effective therapy for serious systemic *Aeromonas* infections. Based on susceptibility studies, newer cephalosporins may also be effective.[613] Combination aminoglycoside-cephalosporin therapy has been recommended in selected critical circumstances.[612]

Whether *Aeromonas* is a frequent cause of diarrheal disease in the United States has not been determined. This toxin-producing organism is easily "missed" on routine stool culture. Oral TMP/SMX appears to be effective therapy for diarrheal syndromes.[610] As with many other intestinal pathogens, the newer oxyquinolones may have an important role.[614]

P. BACTEROIDES FRAGILIS

The importance of *Bacteroides fragilis* in mixed aerobic/anaerobic infections, especially those occurring beneath the diaphragm, is now well-appreciated. Therapy seldom requires the use of agents targeted against each and every bacterial component. However, most authorities advise "good anaerobic coverage" when anaerobic infection is suggested by the clinical setting, odor, Gram's stains, or cultures. Debate centers over what constitutes "good anaerobic coverage."

Clinical trials have generally failed to demonstrate superiority of one agent over another not only because of the diversity and complexity of such infections but also because the majority of patients require adjunctive surgical management. Trials often suggest that drugs active against approximately 80 percent of *B. fragilis* isolates are as efficacious as those inhibiting virtually 100 percent of strains. However, we feel that a drug active against virtually all strains should be used for life-threatening infections likely to include this pathogen.

A recent nationwide survey of isolates from large medical centers indicates that *B. fragilis* continues to be uniformly susceptible to metronidazole and chloramphenicol. Somewhat alarmingly, seven percent of isolates were resistant to clindamycin. There was greater resistance to piperacillin (eight percent), cefoxitin (16%), cefotaxime (42%), cefoperazone (54%), and tetracycline (64%).[619, 620] These data are useful for community hospitals as well, since strains of *B. fragilis* from either community hospitals or from large teching centers tend to exhibit similar susceptibility patterns.[617]

Clindamycin and chloramphenicol appear to be equally effective for infections outside of the central nervous system.[618] However, metronidazole may be recognized as the drug of choice for extremely severe infections due to *B. fragilis* (Section VI). With excellent bioavailability, oral metronidazole therapy should be used when feasible as the most cost-effective approach. Of course, the lack of aerobic coverage by metronidazole mandates concomitant use of additional drugs in mixed infections.

Although many of the newer beta-lactam agents appear active against *B. fragilis*, there may be a considerable inoculum effect. This is especially great for cefotaxime and cefoperazone as compared to cefoxitin.[619] Unfortunately, some strains seem to be acquiring resistance to cefoxitin by a novel mechanism.[620] Because beta-lactamase production partially explains resistance to penicillins and cephalosporins, it seems logical to explore the use of beta-lactamase inhibitors such as clavulanic acid. Experimental studies support this approach.[621] Further clinical data will be of much interest, since the beta-lactamases produced by *B. fragilis* may also protect other organisms including aerobic gram-negative rods within these mixed infections.[622]

Q. CLOSTRIDIUM DIFFICILE

Many hospital laboratories now offer diagnostic tests for this organism or its toxin, now known to

be the major cause of antibiotic-associated colitis. It seems that certain antibiotics predispose to this syndrome not only by promoting overgrowth of *C. difficile*, but also by actually stimulating toxin production.[623, 624] Documentation of this syndrome warrants specific therapy in order to alleviate symptoms, reduce the likelihood of severe progressive colitis, and prevent spread to other hospitalized patients.

Oral vancomycin is the treatment of choice despite a relapse rate of up to 24 percent.[625] Since the cost of oral vancomycin is considerable, dose is an issue. A dose of 125 mg four times daily is as effective as 500 mg four times daily at a substantial savings.[626] An even greater potential for savings would be the use of oral metronidazole, which has also been shown to be effective.[627] The possibility that oral bacitracin might be yet another option has not been fully investigated.

R. OTHER ANAEROBIC BACTERIA

The time-honored dictum that penicillin G is the treatment of choice for anaerobic infections above the diaphragm is being challenged.[628] For reasons not entirely clear, an increasing percentage of strains of organisms such as *Bacteroides melaninogenicus* are now resistant to concentrations of penicillin achievable with conservative doses.[629-632] We previously discussed whether clindamycin should replace penicillin for therapy of anaerobic pleuropulmonary infections (Section VIII) and we can expect similar debate over other syndromes.

S. LOOKING BACK

The reader will note a familiar, repetitive theme: increasing resistance of common pathogens partially offset by still-newer antibiotics. This expensive enterprise is necessitated in part by our overuse of these valuable agents. In the final section, we shall summarize some current perspectives for cost-effective antimicrobial therapy.

X. GUIDELINES FOR PRACTICING PHYSICIANS AND COMMUNITY HOSPITALS

A. A MATTER OF PRIORITIES

In our order of priorities, cost should rank behind efficacy and safety (Table 48). This basic principle especially applies to life-threatening syndromes such as septicemia and meningitis. One should recognize, however, that most infections can be treated with older and relatively inexpensive antimicrobial agents. Although many hospital-acquired infections — such as those due to *Pseudomonas aeruginosa* and methicillin-resistant *Staphylococcus aureus* — require costly regimens, careful analysis usually suggests less expensive alternatives.

TABLE 48. DESIDERATA FOR ANTIMICROBIAL THERAPY IN ORDER OF PRIORITY

I. Efficacy

II. Toxicity

III. Cost

We face a continued onslaught of still-newer, still-more costly antibiotics with only putative advantages regarding efficacy and safety. Each new agent challenges our sense of priorities. How much should we be willing to pay for small (and sometimes only theoretical) advantages? Perhaps we can borrow analogies from other fields.

Let us consider two bottles of wine (Figure 16). A California burgundy ($2.57 at a grocery store) and an aged French bordeaux ($925.00) accomplish the same purpose. Both stimulate the appetite, improve the conversation, and make the entrée seem tastier. Both may cause dose-related side effects: an unfortunate remark, a domestic

(Continued on page 231)



FIGURE 16. The undated California burgundy and the 1879 Saint-Emilion have similar pharmacokinetics, mechanisms of action, indications, contraindications, and toxicities, but differ radically in price ($2.57 versus $925.00) (see text).

FINANCIAL CHECKUP

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Tax Shelter Co-Ordinator: E.F. Hutton

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HOW TO BUY LIFE INSURANCE

Everyone knows they should have it. They just don't know what type to buy.

If you haven't taken a close look at life insurance lately, you may be surprised at what you find. Today's new breed of products not only offers traditional protection for your loved ones but benefits that you can enjoy as well. Yet with all the innovations comes one major problem - how can you determine which of the many new products available is just right for you? The following is a description of the three most common types of life insurance available and which is most suitable for whom:

Term Insurance - Its name tells it all.

At first glance, term insurance appears to be the cheapest form of protection. But it has some limitations and serious ones at that. For instance, term does indeed feature lower premiums than other forms of life insurance for younger policy holders. But the older you get, the higher your premiums until what was inexpensive coverage at age 35 has become surprisingly costly by the time you reach 60 - and prohibitive by 75. In short, just when you are most likely to need term life insurance, you may not be able to afford it. This is why fewer than 1% of all term insurance policies written ever pay a death benefit.

As a rule of thumb, if you need insurance protection for five or more years, you'd be better off with what is known as "permanent" life insurance. But if permanent, what kind?

Whole Life - One step beyond term.

Whole life is different from term in that it not only offers permanent protection but a savings plan as well. A portion of your premium is invested by the insurance company to produce earnings that are credited to your account as "cash value." The cash value accumulates tax-deferred. You can either use this cash build-up to pay future premiums, or you can borrow the money at an interest rate that is generally well below prevailing levels.

Some whole life policies - specifically participating policies issued by mutual life insurance companies - pay dividends on any excess investment earnings, mortality savings and savings remaining after the company pays its current year's benefits and other expenses. These dividends may be used to help pay your premiums, left to accumulate interest, or used to buy additional insurance.

Unlike term insurance, whole life premiums are generally level over the life of your policy. On the other hand, they are considerably higher initially.

For years, whole life provided important coverage for millions of people, but its glamour palled as consumers began to see how poorly it performed in an inflationary environment. In fact, in 1978 the Federal Trade Commission reported that the average internal rate of return for traditional "whole life" insurance was 1.3% (exclusive of the death benefit). Not a very attractive return on the policyholder's money, to be sure. (Note: the internal rate of return is the actual amount earned as cash value after the insurance company has deducted commissions, administrative costs and mortality costs.)

Universal Life - The third alternative.

In repsonse to consumer dissatisfaction, several insurance companies, led by E.F. Hutton Life Insurance Company, created a revolutionary new product in 1978. The product - a bold new alternative to term and whole life - was called "universal life." Universal life offers not only protection but cash value that accumulates at current competitive rates. Furthermore, cash value may be withdrawn or borrowed, giving you significant liquidity. Premiums may be raised, lowered, or even skipped occasionally provided there is sufficient cash value in the policy. Finally, coverage may be adjusted up (subject to evidence of insurability) or down as your insurance needs change without rewriting the policy.

The combination of these features, plus an average internal rate of return of 7-9%, has given the product "universal" appeal. In fact, while in 1980 there were fewer than a dozen companies offering universal life insurance, today there are more than 300 different life insurance companies selling the product.

Which coverage is right for you?

So now you not only have a myriad of insurance companies to choose from, you must also decide between term, whole life, or universal life. Each has its place. Term insurance is the best way to meet a temporary need; whole life is suitable for the person who insists upon knowing exactly what will happen over the life of the policy and is willing to give up the probability of a higher return in order to get that assurance; universal life appeals to the modern investor because of its flexibility and its ability to adapt to changing market conditions and client needs.

Another touted solution to the insurance dilemma has been "buy term and invest the difference," meaning the difference between the premiums for whole life or universal life and lower-cost term. Trouble is, however, that few policyholders have either the discipline or the expertise to do that. This aphorism also overlooks that fact that term insurance premiums increase annually. As you grow older, you'll have less to invest every year. And unless you manage to accumulate enough assets to leave your loved ones an adequate estate, you may be forced to pay exhorbitant premiums for term insurance protection during your retirement years. Or, worst of all, you may find yourself uninsurable. In addition, the "buy term and invest the difference" approach ignores the fact that a life insurance contract has special tax advantages which allow cash values to grow and compound without current taxation. As a matter of fact, universal life insurance is really a tax favored way to "buy term and invest the difference" in a permanent life insurance contract. (To be continued next month).

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If you would like to receive further information on any of the topics covered in this newsletter, please write to Martin Lefkowitz, CFP, E.F. Hutton & Company, Inc. 2700 Middleburg Drive, Suite 200, Columbia, SC 29204; or Call (800) 922-1112.

argument, or a hangover. Occasionally, the toxicity proves fatal: an automobile accident, a gunshot wound, or cirrhosis.

The bordeaux will receive the most publicity and be the choice of connoisseurs. However, any experienced oenologist will say that the more one knows bout wine, the less one is willing to pay for it. The same is true of antibiotics.

B. THE HOSPITAL FORMULARY

Just as we stock our wine cellars with the most parsimonious choices, so can we operate inexpensive hospital formularies. We can use oral therapy whenever possible. We can use penicillin G and gentamicin whenever possible. We can include only one first-generation cephalosporin and ignore the second-generation cephalosporins (using oral metronidazole when coverage against *Bacteroides fragilis* is desirable). We might stock one or two third-generation cephalosporins, but we would require consultation with a chief-of-service for their use. We can similarly restrict the use of our one antipseudomonal penicillin (having chosen either ticarcillin, mezlocillin, azlocillin, or piperacillin on the basis of competitive bidding). Intravenous administration of such agents as erythromycin, clindamycin, or TMP/SMX would call for automatic peer review.

If the reader surmises that we advocate such a strict or rigid formulary, then we consider this issue to have been a failure. We have attempted throughout to convey our excitement about the many new agents given to us by the drug industry. Some of these agents hold the promise not only of safer, more effective therapy but also of greater cost-effectiveness. We must caution, however, that "cost-effectiveness" is becoming an advertising cliché. One hears arguments that this or that drug is actually more "cost-effective" despite its higher acquisition costs. Having let such a drug through the formulary gates, we may wake up to find a Trojan horse.

C. EDUCATION VERSUS ENFORCEMENT

Kunin has reviewed the alternative methods by which hospitals can control the use of antimicrobial agents.[632, 633] These methods include educational programs, restricted contact with pharmaceutical representatives, a closed formulary, selected reporting of sensitivity tests, automatic "stop orders," and required written justification or consultation to obtain certain agents. Some of these methods, alone or in combination, have been shown to be effective.[634-642] Perhaps the simplest and most promising is the use of a special antibiotic order sheet which forces the prescribing physician to "think twice."[641, 642] However, nearly all such studies have been carried out within teaching hospitals.

Of the alternative control measures, education is the most palatable. Unfortunately, at least as traditionally carried out, it appears to be the least effective. In settings such as university or Veterans Administration hospitals, intense educational efforts have led to more cost-effective therapy but costs typically rise once teaching stops. Continuous or repetitive teaching for practicing physicians in community hospitals is impractical. There are too many competing demands.

D. HORIZONS

We cling to the belief that education rather than enforcement is the best long-range solution. However, we doubt the efficacy of traditional formats such as journal articles and lectures. Computer technology is promising. As demonstrated by Yu et al.,[643] physicians can use computer terminals to make rational (and cost-effective) choices. Another strategy applicable to office practice is the use of "counter-detailing" as described by Schaffner et al.[644] However, the latter approach requires visits to the physicians' offices by a drug educator or by another physician and is probably too labor-intensive.

The Joint Commission for Accreditation of Hospitals requires ongoing reviews of antimicrobial agents and other drugs. Hospital staffs are required to write their own guidelines for such reviews. We suggest that general guidelines can be written in such a way as to promote medical staff discussions of cost-effectiveness (Table 49). Such discussions could lead to consensus statements regarding cost-effective approaches to various clinical situations.

We should require that pharmacies provide medical staffs with better information about actual costs. Throughout this issue, we have hesitated to make dogmatic recommendations in part because actual costs are so variable. We heartily endorse the recent statement by McCue et al.[2]: "Cost-conscious prescribing of antibiotics by physicians would be facilitated by a more consistent relationship between charges and true costs."

TABLE 49. PROPOSED ANTIMICROBIAL REVIEW CRITERIA

I. Preventive therapy

A. Was the most cost-effective agent, as recommended by the medical staff on the basis of the medical literature and local experience, chosen and administered in appropriate dose and by an appropriate route?

B. Was the first dose given prior to the induction of anesthesia?

C. Was therapy continued beyond 72 hours?

II. Presumptive therapy

A. Was the regimen chosen appropriate for the clinical syndrome and severity of the illness?

B. Was therapy modified within 72 hours on the basis of the initial clinical response and/or on the basis of results of culture and susceptibility studies?

C. Could an equally effective but potentially less toxic and less expensive regimen have been used?

III. Precise therapy

A. Does the regimen chosen reflect appropriate interpretation of the culture and susceptibility studies?

B. Could an equally effective but potentially less toxic and less expensive regimen have been used?

C. If more than one agent was used, was this justified on the basis of either the nature or severity of the syndrome being treated or on the need for synergistic therapy?

Hospital laboratories can provide medical staffs with drug susceptibility data in such a way as to facilitate decisions regarding costs. Such data are not only invaluable for choosing presumptive therapy regimens, but can also facilitate formulary decisions by the pharmacy and therapeutics committee. The equation presented earlier (Section IV) can be used to determine the "daily kill per dollar," based on MIC-90 data from the laboratory and cost data from the pharmacy. Earlier, we discussed the limitations of such a simple approach. Nevertheless, it provides a starting point for comparisons.

Earlier, we reviewed the four major components of the cost of antimicrobial therapy (Table 1). A summary of measures to reduce cost of each of these components is shown in Table 50. For almost any patient receiving antibiotics, cost can be reduced by careful attention not only to the actual choice of agents but also to such issues as route, duration, and setting (inpatient versus outpatient) of therapy. Such attention should enable us to continue to make decisions not on the basis of mandates from third parties or regulatory agencies but rather on the basis of our own clinical judgments. □

TABLE 50. PRINCIPAL DETERMINANTS OF THE COST OF ANTIMICROBIAL THERAPY AND SOME CONTROL MEASURES

Determinant	Control measures
Acquisition costs	competitive bidding closed formulary generic substitutions therapeutic equivalency substitutions use of less expensive alternatives (agent; route of administration; frequency; duration)
Administration costs	oral or intramuscular therapy when possible cost-effective delivery systems outpatient therapy
Monitoring costs	judicious use of serum assays and other measurements (e.g., tests of renal, hematopoietic, hemostatic, and liver function; audiometry)
Cost of consequences	early recognition of therapeutic failure early recognition of unwanted effects

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Editorial

WHAT IS "APPROPRIATE ANTIMICROBIAL THERAPY?"

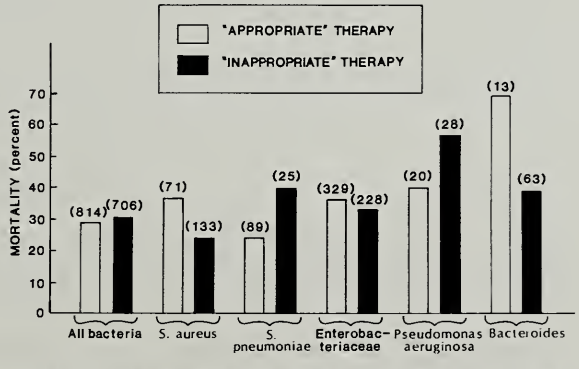
More than we care to admit, definitions determine our actions and attitudes. The purpose of this editorial is to explore the meaning of a term found here and there throughout the medical literature yet seldom defined: "appropriate antimicrobial therapy."

As best I can determine, this term was introduced in 1968 by Freid and Vosti in the Results section of a paper on gram-negative bacteremia.[1] Some background may be in order. Prior to the introduction of antimicrobial agents, the mortality for patients with gram-negative bacteremia was approximately 35 percent. By the late 1950's it had become apparent that the incidence of gram-negative bacteremia was increasing and that the mortality remained about 35 percent. Seeking to identify factors predictive of an unfavorable outcome, McCabe and Jackson studied a number of parameters including whether or not the patient had received an antibiotic to which the infecting microorganism was susceptible *in vitro*.[2] Later, Freid and Vosti used this concept to define "appropriate antibiotic therapy" as "the administration of one or more agents effective *in vitro* against the infecting organisms."[1]

Many subsequent authors have evaluated "appropriate antibiotic therapy" especially as it affects mortality due to gram-negative bacteremia.[3, 4] One also finds this term scattered throughout the medical literature in discussions of one or another disease entity or clinical syndrome. It is usually taken for granted that author and reader understand each other perfectly. A few authors have stipulated that in order to be "appropriate," antimicrobial therapy should also be *prompt* — for example, the first dose should be given within 24 hours of the onset of bacteremia.

In 1977, Dr. Eric Brenner and I began a prospective study of all bacteremias in Columbia, South Carolina.[5] We considered antibiotic therapy to be appropriate "if an agent effective against the bacterium isolated from blood cultures had been administered in sufficient dosage and by a proper route of administration on the day that the first positive blood culture was obtained." We insisted that therapy be started on the calendar day on which the first positive culture was obtained because we were especially interested in whether the physician had elected to prescribe (or change) therapy at the time blood cultures were obtained, as opposed to observing the course of the disease without therapy.

Preliminary analysis of our data three years later indicated no apparent advantage of "appropriate" therapy over "inappropriate" therapy (Figure). Patients with *Bacteroides* bacteremia actually had greater mortality if they received a drug of choice against *Bacteroides* (e.g., chloramphenicol or clindamycin) on the day that the first positive blood cultures were obtained. The lowest mortality rates were experienced by patients who received delayed therapy — that is,



Mortality experienced by patients with bacteremia due to various microorganisms according to whether antimicrobial therapy was determined to be "appropriate" or "inappropriate" by strict definitions. Differences were statistically significant only among patients with *Bacteroides* bacteremia, in whom "appropriate" therapy was actually associated with greater mortality compared to "inappropriate" therapy (see text).

who did not receive any antibiotic on the day that the blood cultures were obtained, but who later received effective therapy. Eventually, we were able to reconcile our data with those of previous investigators by considering both initial therapy (i.e., on the day the blood cultures were obtained) and subsquent therapy (i.e., after the day on which the blood cultures were obtained).[6] We could not demonstrate statistically that administration of effective agents at the time blood cultures were obtained lowered mortality.

It was intuitively apparent (although difficult to prove) that patients who were given effective antibiotic therapy at the time blood cultures were obtained were (as a group) sicker compared to the other patients. In other words, there was greater bedside evidence of "toxicity" compared to the patients whose physicians elected to observe the course of the illness. Emerging from this rather laborious analysis was an appreciation that the term "appropriate" antibiotic therapy, as used by epidemiologists, may correlate poorly with clinical reality. In some instances (e.g., a good-risk patient with few clinically-apparent stigmata of sepsis), the truly "appropriate" clinicial decision may be to obtain blood cultures and wait rather than to prescribe broad-spectrum antibiotic therapy.

More recently, the phrase "appropriate antibiotic therapy" has surfaced in discussions of cost-effectiveness. Again, there may be a discrepancy between what is considered to be "appropriate" according to a definition and what represents sound clinical judgment. Precarious clinical situations may suggest the need to use a more expensive agent or combination of agents rather than a pre-designated "appropriate cost-effective choice."

As presently used, the term "appropriate antimicrobial therapy" serves too many masters. I suggest different terms for different users: "*effective therapy*," "*appropriate therapy*," and "*recommended therapy*" (Table).

(1) "*Effective antimicrobial therapy*" would consist of the use of an agent shown to be active *in vitro* and/or generally regarded as a drug of choice against the infecting microorganism in adequate dose and by a suitable route of administration. This definition would serve the needs of epidemiologists studying the relationship of antimicrobial therapy to outcome.

(2) "*Appropriate antimicrobial therapy*" would consist of therapy considered to be optimum for the clinical situation. This term would encompass the notion of effective therapy but would also take into account clinical judgment pertaining to the certainty of diagnosis, the severity of the infection being treated, and the severity of the patient's underlying disease. This definition would serve the needs of clinicians caring for individual patients.

(3) "*Recommended antimicrobial therapy*" would refer to regimens based on the deliberations of a policy-setting body, such as a hospital's pharmacy and therapeutics committee. This definition would encompass not only "effective ther-

PROPOSED CATEGORIES FOR EVALUATING ANTIMICROBIAL THERAPY

Category*	Designated users
"Effective" therapy	Epidemiologists conducting studies
"Appropriate" therapy	Clinicians caring for individual patients
"Recommended" therapy	Policy makers seeking to reduce costs

*For definitions, see text.

apy" and "appropriate therapy," but would also take into account the cost. This definition would serve the needs of administrators and policy makers seeking to contain the cost of medical care.

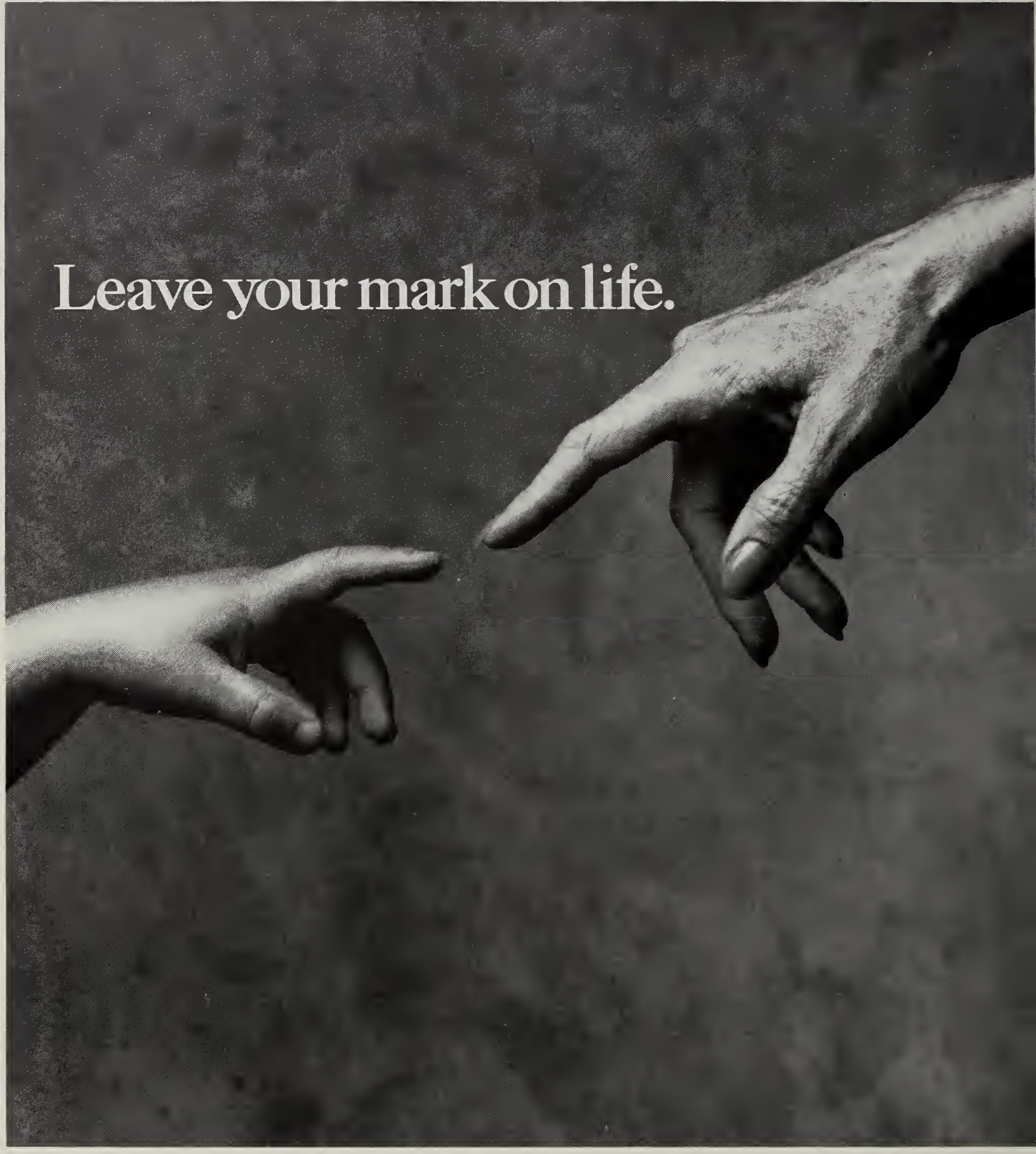
The pharmaceutical industry now provides us with a number of effective alternatives for most infectious syndromes. The notion that there is a "drug of choice" for this or that infection rapidly approaches obsolescence. Administrators and medical staffs should seek consensus opinions regarding the most cost-effective (or "recommended") therapy for common problems. However, "appropriate" therapy should be determined by the physician caring for the individual patient.

These distinctions may seem rather tedious — somewhat reminiscent of the terms "local" versus "focal" used by renal pathologists in their microscopic descriptions of the glomerulus. However, unrestricted use of the term "appropriate antimicrobial therapy" may no longer be--- well--- "appropriate."

— CSB

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President's Page



IDEALISM AND REALITY

Dear John:

This will be my last letter to you so I'll try to leave you with some food for thought for the coming days. The most basic conflict that I see confronting us is the one between idealism and reality.

Idealism, in this context, are the tenets which we have developed across the years relative to our patient/physician relationship. The individualized, specific care that has developed has served the public and us well. Professionally we have placed these tenets within our minds as the truth and have used them as the governing principles of our activities. The old Dorchester County Society Constitution written in the middle 1800's described its purpose this way. "The purpose of this society shall be to form an organization of the physicians so that by frequent meetings and full and frank interchange of views they may secure such intelligent unity in every phase of their labor as will elevate and make effective the opinions of the profession in all scientific, public policy and health, material and social affairs."

Reality for us are these new systems and modifications in health care delivery which are being thrust upon the public. We must remember that reality is never the truth. It is simply what it is. Reality is neither true nor false. It is only what we say about them, only the names we give them, our theories of their source and nature and remote relations that may be true or not. We receive, in short, the block of marble, but we carve the statue ourselves.

The relevance of all this is that we must deal with the realities as they appear. We must also interpret and react to these realities on the basis of our established ideals. The third party imposition into the patient/doctor relationship will create strains far beyond the imagination. Given the increasing cost pressures on health care today, it may seem unlikely that the momentum to group care as long as it seems to be cheaper will be slowed. Yet the notions of group centered care carry with them a fundamental alteration on the focus of health care and of the patient/physician relationship. In seeking to delay rationing decisions by cost containment measures, the community orientation carries with it the very notions of patient sacrifice that it seeks to avoid. Although the issues such as the rise of corporate practices in medicine, cost, and related matters not addressed here will all figure prominently, at heart here is the very essence of medical care.

The joy of it all is that we have a great opportunity here. We need to increase our membership, stand as united as possible even with our diversity of interests. We must follow the leadership of our association because they have a broader knowledge of the field than we do individually. There is a way to go and they will find it.

The final framework of the new system is being poured but is not yet hardened. We must continue to interject with all our vigor those truths which we know. The reality of it is here but good medicine must also prevail.

And John, always remember the words of Osler: "First do no harm."

Sincerely,

J. Gavin Appleby, M.D.
President

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INFORMATION FOR AUTHORS

Authors should refer to the detailed instructions in the February issue. Manuscripts and other correspondence should be addressed: The Editor, JOURNAL OF THE SOUTH CAROLINA MEDICAL ASSOCIATION, Post Office Box 11188, Columbia, S. C. 29211.

All manuscripts should be accompanied by a transmittal letter with the following paragraph: "This original work has not been submitted or published elsewhere, in entirety or in part. I (we) hereby transfer, assign, or otherwise convey all copyright ownership to the South Carolina Medical Association in the event that this work is published by the SCMA."

We request that manuscripts be concise (no longer than 8 typewritten pages, double-spaced), with no more than ten references. These should be cited in the text in superscript, e.g., "Bottsford, et al.[3]", and should conform to the following style: "3. Bottsford JE, Bearden RC, Bottsford JG: A ten year community hospital experience with abdominal aorta aneurysms. *J S C Med* Assoc 79: 57-62, 1983." Ordinarily, publication of four small illustrations or tables or the equivalent will be paid for by *The Journal.* Manuscripts should be submitted in duplicate. Reprints will be made available by the publisher.

THE JOURNAL
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VOLUME 82 APRIL 1986 NUMBER 4

ONE HUNDRED THIRTY-EIGHTH ANNUAL MEETING

THE SHERATON
CHARLESTON HOTEL
CHARLESTON, SOUTH CAROLINA
APRIL 23-27, 1986

1986 marks the sixth consecutive year that the Association's Annual Meeting has been held in Charleston, but the last year the Sheraton will serve as Meeting Headquarters. In 1987, the Annual Meeting will be at the new Charleston Omni.

All details regarding the meeting, including pre-registration forms and hotel reservation cards, have been mailed to the membership. If additional information is needed, contact SCMA Headquarters at 798-6207. Again this year, there is no registration fee for SCMA members.

The House of Delegates will meet on Thursday, April 24 and again on Sunday, April 27, with Speaker of the House, *O. Marion Burton, M.D.*, presiding. Two hundred fourteen delegates will represent local and county medical societies, specialty societies, Resident Physicians, students, and representatives from DHEC and the two medical schools.

General scientific sessions are "Current Concepts In Cardiology" on Friday morning, and "Infectious Diseases: Issues and Challenges" on Saturday morning. Scientific workshops on a variety of topics of interest to practicing physicians are scheduled for each afternoon beginning on Wednesday. The popular Sports Medicine Symposium will be held again this year, as well as a Risk Management Seminar. Consult the schedule of events elsewhere for times and locations.

The SOCPAC luncheon speaker is *Mr. Roy Pfautch*, nationally known political consultant and Past President of the American Association of Political Consultants. He has also served as a research analyst for AMPAC and many other organizations. *Harrison L. Rogers, Jr., M.D.*, President of the American Medical Association, is a special guest and will address the House of Delegates on Thursday morning.

With regard to the 1986 elections, *J. Gavin Appleby, M.D.*, current President completing the term of the late *Leonard W. Douglas, M.D.*, will step down and assume the office of Immediate Past President. *Walter J. Roberts, Jr., M.D.*, elected President-Elect in a special session of the House of Delegates last November, will be sworn in as President. An election for Vice Speaker of the House will also be necessary, as the position became vacant when *O. Marion Burton, M.D.*, assumed the office of Speaker. These and other elections are detailed later in this issue.

The SCMA Auxiliary will hold its Annual Meeting concurrently with the SCMA and, in addition to the necessary business which must take place, many special activities have been planned. Again this year, Mead Johnson Nutritional Division has organized and will provide the prizes for a golf tournament on Friday afternoon. Several specialty societies will be holding meetings, and

alumni activities are numerous.

The SCMA Board of Trustees meets on Wednesday, April 23 and again at breakfast each day to consider business which arises during the House of Delegates meeting.

On-site registration will be facilitated by personal computers, but members are urged to preregister if at all possible.

This issue of *The Journal* contains those reports, Resolutions and other information available at publication deadline. Additional reports received after this issue has gone to press will be included in the Delegates Handbooks which will be mailed prior to the meeting. Delegates are asked to cooperate in passing along their handbooks to an Alternate Delegate if circumstances prevent them from attending.

A summary of Annual Meeting highlights will be published in the SCMA "Newsletter" following the meeting.

— JGD

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ONE HUNDRED THIRTY-EIGHTH ANNUAL MEETING
SCHEDULE OF EVENTS

Wednesday, April 23, 1986

GENERAL

TIME/LOCATION	TOPIC
7:30-8:30 am Charleston 220	SCMA Board of Trustees Breakfast
8:30 am-12:30 pm Cotillion C	SCMA Board of Trustees Meeting
12:30-1:30 pm Cotillion B	SCMA Board of Trustees Luncheon
1:30-5:00 pm Cotillion C	SCMA Board of Trustees Meeting
1:00-5:00 pm Citadel Ballrooms and Peacock Promenade	Exhibitors Setup
2:00-3:00 pm Lord Proprietor's Parlour, Room 1310	Auxiliary Finance Committee Meeting
1:00-7:00 pm Lobby	SCMA & Auxiliary Registration Open
3:00-4:30 pm Lord Proprietor's Parlour, Room 1310	Auxiliary Long Range Planning Committee Meeting
4:00-5:30 pm Cotillion A 213	Auxiliary Wine Tasting Compliments of First Union National Bank of S. C.

SCIENTIFIC

TIME/LOCATION	TOPIC
1:00-3:00 pm Defense 216	Scientific Workshop *ECG: basic/advanced* Christie B. Hopkins, M.D.
1:00-3:00 pm Little David 225	Scientific Workshop: *High Risk Pregnancy* Harold R. Rubel, M.D. Alan D. Mease, M.D. Alexander R. Smythe, M.D.
3:30-5:30 pm Little David 225	Scientific Workshop: *Geriatrics: Atypical presentations of illness* Shawn A. Chillag, M.D.
3:30-5:30 pm Prosper 229	Scientific Workshop: *Echocardiography — when and for whom?* Bruce W. Usher, M.D.
3:30-5:30 pm Hunley Room 223	Scientific Workshop: *Pulmonary Medicine Update* Stephen A. Sahn, M.D. John E. Heffner, M.D. K. Scott Miller, M.D. William R. Cook, M.D.

Thursday, April 24, 1986

GENERAL

TIME/LOCATION	TOPIC
7:00 am-5:00 pm Lobby	SCMA and Auxiliary Registration
7:30-8:30 am Charleston 220	SCMA Board of Trustees Breakfast
7:30-8:30 am Cotillion A	SCMA Past Presidents' Breakfast
7:30-8:30 am Lord Proprietor's Parlour, Room 1310	Specialty Society Delegates Meeting
7:30-8:30 am Ashley's	Continental Breakfast Sponsored by the MUSC Student Council

SCIENTIFIC

TIME/LOCATION	TOPIC
2:30-5:30 pm Cotillion B	Scientific Workshop *Controversial issues in long-term care* Charles N. Still, M.D. *The Tardive Diskenesia Controversy: Medicolegal Risks and Medical Management* Richard Borison, M.D., Ph.D., Augusta, Georgia *Neuroleptic Malignant Syndrome and Other Drug-Induced Disorders*

Thursday, April 24, 1986 (continued)

GENERAL

TIME/LOCATION	TOPIC
8:30-9:30 am Palmetto State Room 213	Auxiliary Breakfast
8:00 am-5:00 pm Citadel Ballroom & Peacock Promenade	Exhibits Open
8:30 am-12:00 Noon Cotillions B & C	SCMA House of Delegates
10:00-11:00 am Hunley 223	MUSC Medical Alumni Board Meeting
10:00 am-12:00 Noon Charleston 220	Auxiliary Executive Board Meeting
12:30-2:00 pm Lord Proprietor's Parlour, Room 1310	Auxiliary Past Presidents' Luncheon
12:15-2:00 pm Cotillion A	MUSC Alumni Luncheon
12:30-1:30 pm Palmetto State Room 213	Reference Committee Chairmen's Luncheon
1:30-3:00 pm Rooms 216, 223, 225, 220, 229	SCMA Reference Committee Meetings (Specific room assignments will appear in Delegates Handbook)
2:30-4:30 pm	Auxiliary Antique Shops Tour
3:00-5:00 pm Rooms 229, 213, and 220	SCMA Reference Committee Meetings (Specific room assignments will appear in Delegates Handbook)
4:00-5:00 pm Lord Proprietor's Parlour, Room 1310	SCMA/SCIMER Scholarship Interviews
6:00-7:30 pm Cotillion A	SCMA Reception Honoring Delegates, Alternates and Exhibitors
7:00-9:00 pm Palmetto State Room 213	National Health Service Corps Reception

SCIENTIFIC

TIME/LOCATION	TOPIC
	G. Alan Stoudemire, M.D., Atlanta, Georgia
2:30-5:30 pm Cotillion C	Scientific Workshop: *Epilepsy Symposium* *Diagnosis of Epileptic Seizures and Epileptic Syndrome* Braxton B. Wannamaker, M.D. *Therapy for Epilepsy in Pediatric Patients* O. Carter Snead, III, M.D., Birmingham, Alabama *Behavioral Complications in Epilepsy* William Brannon, M.D. *Status Epilepticus — Types, Causes and Therapy* Paul B. Pritchard, III, M.D.
3:30-5:30 pm Hunley 223	Scientific Workshop: *Update on Rheumatism* E. Carwile LeRoy, M.D.
3:30-5:30 pm Little David 225	Scientific Workshop: *Medical Education in South Carolina* Richard L. Dobson, M.D. J. O'Neal Humphries, M.D.
3:30-5:30 pm Defense Room 216	Scientific Workshop: *Trauma: Pitfalls in Management Before Definitive Care* Richard M. Bell, M.D., F.A.C.S.

Friday, April 25, 1986

GENERAL

TIME/LOCATION	TOPIC
7:00 am-5:00 pm Lobby	SCMA Registration Open
7:00 am-12:00 pm Lobby	Auxiliary Registration Open
7:30-8:30 am Charleston 220	SCMA Board of Trustees Breakfast
8:00 am-5:00 pm Citadel Ballrooms and Peacock Promenade	Exhibits Open
8:30-9:30 am Poolside	Auxiliary Breakfast
8:30-11:00 am Palmetto State, 213	Sports Medicine Committee Breakfast Meeting
9:00-10:30 am Defense 216	Professional Liability Committee Meeting
9:00-11:00 am Prosper 229	S. C. Medical Care Foundation General Membership Meeting and Board Meeting
10:00 am-12:00 Noon Cotillion B	Auxiliary House of Delegates
10:30-11:30 am Defense Room 216	SCIMER Board Meeting
11:00 am-1:00 pm Hunley 223	School and Athletic Health Meeting
12:00 Noon Yeaman's Hall Country Club	Golf Tournament — Organized by and Prizes Awarded by Mead Johnson Nutritional Division
12:00 Noon-1:30 pm Defense 216	Editorial Board Luncheon
12:30-2:00 pm Cotillion A	Auxiliary Luncheon
2:00-4:00 pm Cotillion B	Political Seminar Guest Speaker: Susan Bryant
4:00-6:00 pm Cotillion A	S. C. Psychiatric Association — General Membership Meeting
4:30-5:30 pm Room 302	S. C. Oncology Society Reception
5:00-7:00 pm Palmetto State Room 213	Duke Alumni Reception

SCIENTIFIC

TIME/LOCATION	TOPIC
8:00 am-12:30 pm Cotillion C	General Scientific Session *Current Concepts in Cardiology* Moderator: J. O'Neal Humphries, M.D. *Medical management of angina* James Spann, M.D. *Thrombolysis for coronary occlusion* Sol Sherry, M.D. Dean & Distinguished Professor Temple University Health Sciences Center, Philadelphia, PA *Balloon Angioplasty of Stenotic Coronary Arteries* Thomas E. Hearon, III, M.D. *Current Status of Coronary By-pass* Joe R. Utley, M.D.
1:30-5:00 pm Cotillion C	Sports Medicine Symposium W. Ray Henderson, M.D., Presiding Keynote Speaker: Stephen G. Rice, M.D., Ph.D., MPH University of Washington Seattle, Washington *Education in Sports Medicine* *Emergency Preparedness and Injury Management* *Athletic Trainer and the Student Trainer* *Putting It All Together — Health Care for the High School Athlete*
1:30-5:30 pm Charleston 220	S. C. Diabetes Association Symposium Hulda Wholtman, M.D. Thomas G. Skillman, M.D. Neil H. White, M.D.
2:00-4:30 pm Palmetto State 213	"Cancer Update" Topic: *Lymphokine-Activated Killer Cells and Recombinant Interceukin-2*

Friday, April 25, 1986 (continued)

GENERAL

TIME/LOCATION	TOPIC
5:00-7:00 pm Press Room, Decatur 209	Public Relations Committee Meeting
5:30-7:00 pm Lord Proprietor's Parlor, Room 1310	Bowman-Gray Alumni Reception
6:00-7:30 pm Cotillions B & C	Reception Compliments of Geer Drug Company
	MUSC Reunions
7:00 pm Ferante's	Class of 1941
6:30 pm 82 Queen	Class of 1946
6:30 pm Sheraton, Hunley 223	Class of 1951, Reception
7:30 pm Sheraton, Charleston 220	Class of 1951, Banquet
7:00 pm Fiddler's Restaurant	Class of 1956
7:30 pm Planter's Inn	Class of 1961
7:30 pm The Colony House	Class of 1966
7:30 pm Sheraton, Cotillion A	Class of 1976

SCIENTIFIC

TIME/LOCATION	TOPIC
	Stephen E. Ettinghausen, M.D. National Cancer Institute John H. McCulloch, M.D.
2:30-4:30 pm Little David 225	Scientific Workshop *Cocaine Addiction* Douglas F. Crane, M.D.
2:30-4:30 pm Hunley 223	Scientific Workshop *Patient Education in Primary Care* William H. Hester, M.D.
2:30-4:30 pm Defense 216	Scientific Workshop *Topics in Ophthalmology for the Non-Ophthalmologist* *Ischemic Retinopathy* James L. Haynes, M.D. *Dysthyroid Ophthalmology* Dennis J. Galbraith, M.D. *Glaucoma-Blindness Prevention* David B. Berry, Jr., M.D. *Senile Macular Degeneration* Kenneth Sharpe, M.D. *Management of Eye Trauma* R. Patrick Yeatts, M.D *New Hope for Glaucoma Patients* Elizabeth Sharpe, M.D. *Diabetes and the Eye* William F. Crosswell, M.D.
2:30-4:30 pm Prosper Room 229	Scientific Workshop *Update in Urology: Newer Methods of Managing Erectile Dysfunction* Robert P. Nelson, M.D. *Insights into the Male Factor in Infertility* Leroy M. Nyberg, M.D.

Saturday, April 26, 1986

GENERAL

TIME/LOCATION	TOPIC
7:00 am-5:00 pm Lobby	SCMA Registration Open
7:30-8:30 am	SCMA Board of Trustees

SCIENTIFIC

TIME/LOCATION	TOPIC
8:00-11:00 am Hunley Room 223	S. C. Society of Neurological Surgeons *Hematoma of the Third*

Saturday, April 26, 1986 (continued)

GENERAL

TIME/LOCATION	TOPIC
Charleston Room 220	Breakfast
8:00 am-12:30 pm Citadel Ballrooms & Peacock Promenade	Exhibits Open
8:00-11:30 am Palmetto State 213	S. C. Chapter American Academy of Family Physicians
9:00-11:00 am Prosper Room 229	SOCPAC Board Meeting
12:30-1:30 pm Prosper Room 229	S. C. Radiological Society Reception
12:30-3:00 pm Palmetto State 229	S. C. Chapter American Academy of Pediatrics and S. C. Pediatric Society Executive Committee Luncheon
12:45-2:15 pm Cotillion A	SOCPAC Luncheon Guest Speaker Roy Pfautch
1:00-2:30 pm Hunley 223	Interns and Residents Meeting
1:30-3:30 pm Charleston Room 220	S. C. Radiological Society Luncheon and Meeting
2:30-5:00 pm Cotillion C	Risk Management and Tort Reform Update Guest Speaker: Donald J. Palmisano, M.D., J.D.
6:30-7:30 pm Citadels A & B	SCMA Presidents' Reception
7:30 pm-12:00 am Cotillions A, B, & C	SCMA Banquet

SCIENTIFIC

TIME/LOCATION	TOPIC
	Ventricle Kenneth Kammer, M.D. *Experience with PLIF* Steve Rawe, M.D. *Intracarotid BCNU* Steve Gardner, M.D. *Glioblastoma — Five Year Survival* O. M. Ballinger, M.D.
8:00 am-12:30 pm Cotillion B	S. C. Chapter American Academy of Pediatrics and S. C. Pediatric Society Meeting and Scientific Session *Rocky Mountain Spotted Fever* Julius E. Robinson, M.D. *Brain Tumors in Children — Comprehensive Care* Ronnie W. Neuberg, M.D. *Syncope* Bertrand A. Ross, M.D.
8:30 am-12:30 pm Cotillion C	General Scientific Session *Infectious Diseases: Issues and Challenges* Moderator: James C. Allen, M.D. *Acquired Immunodeficiency Syndrome (A.I.D.S.)* Donald Armstrong, M.D. Chief, Infectious Disease Division, Memorial Sloan-Kettering Cancer Center, New York, N. Y. *A.I.D.S. — the South Carolina Experience* John V. Rullan, M.D. *New Antibiotics — Sorting Through the Maze* Charles S. Bryan, M.D. *Principles of Antibiotic Prophylaxis* Glenn W. Geelhoed, M.D. Professor of Surgery, George Washington University School of Medicine, Washington, D. C.
9:30 am-12:30 pm Charleston Room 220	S. C. Radiological Society Scientific Session

Saturday, April 26, 1986 (continued)

SCIENTIFIC

TIME/LOCATION	TOPIC
	Interventional Neuroradiology R. C. Holgate, M.D. *The Pediatric Airway* Roderick Macpherson, M.D. *High Resolution Ultrasound of the Scrotum* Ellsworth Weatherby, M.D. *The Swollen Gland Story (Endocrine Radiology)* John Stanley, M.D. *SPECT Imagining with Newer Pharmaceuticals* Kenneth Spicer, M.D.
2:00-4:30 pm Defense Room 216	S. C. Society of Pathologists Scientific Program *Immunostaining — An Overview:* *Practical Applications* Pathology Department, MUSC *Pitfalls and Cautions in Immunoenzyme Histochemical Techniques* Mrs. Lorraine Hennigar *Application of Immunohistochemistry Techniques to Surgical Pathology* A. J. "Jerry" Garvin, M.D. *Value of Immunocytochemical Techniques in Lung Disease* Russell A. Harley, M.D. *Immunocytochemistry in Neurological Disease* J. Douglas Balentine, M.D.

Sunday, April 27, 1986

GENERAL

TIME/LOCATION	TOPIC
7:00-10:30 am Lobby	SCMA Registration Open
7:30-8:30 am Charleston Room 220	SCMA Board of Trustees Breakfast
8:30 am-12:30 pm Cotillions A & B	SCMA House of Delegates

ELECTIONS 1986

OFFICERS:	President-Elect:	
	Secretary:	Elected annually, limited to three consecutive terms. John W. Simmons, M.D., elected 1985. Eligible for two additional terms.
	Treasurer:	Nominated by the Board of Trustees. Elected annually, limited to three consecutive terms. Thomas C. Rowland, Jr., M.D., elected 1984, re-elected 1985. Eligible for one additional term.
MEDICAL DISTRICT TRUSTEES:		
	District 2:	B. Daniel Paysinger, M.D., elected 1984. Eligible for two additional terms.
	District 2:	Jack L. Ratliff, M.D., elected 1980, re-elected 1982 and 1984. Not eligible for re-election.
	District 4:	Charles R. Duncan, Jr., M.D., elected 1982, re-elected 1984. Eligible for one additional term.
	District 4:	William J. Goudelock, M.D., elected 1984. Eligible for two additional terms.
	District 6:	William H. Hester, M.D., elected 1982, re-elected 1984. Eligible for one additional term.
	District 8:	John W. Rheney, M.D., appointed in 1984 to fill unexpired term of D. Wayne Whetsell, M.D. Elected 1984. Eligible for two additional terms.
AMA DELEGATES:		Waitus O. Tanner, M.D., term expires 12/31/86
		John C. Hawk, Jr., M.D., term expires 12/31/86
AMA ALTERNATE DELEGATES:		Charles R. Duncan, Jr., M.D., filling unexpired term of Leonard W. Douglas, M.D. Term expires 12/31/86
		Euta M. Colvin, M.D., term expires 12/31/86
VICE SPEAKER OF THE HOUSE OF DELEGATES:		Limited to three consecutive two-year terms. Position vacant, term expires 1987.

OFFICER REPORTS

REPORT OF THE PRESIDENT-ELECT

It has been my privilege this year to serve the SCMA in two capacities. Shortly after the conclusion of last year's House of Delegates meeting, as Speaker of the House, I began plans for the 1986 meeting. With the help of the officers of the Association, with excellent support from staff, and with the enthusiastic and capable support from the Auxiliary, plans were promptly underway. The Continuing Medical Education Committee, headed by Dr. Jim Long, began structuring another in a series of excellent scientific sessions. Things appeared to be moving along smoothly.

By summer's end, however, our attention was directed toward another project — a rare, mid-year meeting of the House of Delegates, devoted entirely to the effort towards Tort Reform legislation. In a brief time — again with excellent staff support — plans were completed and the successful meeting held in Columbia in mid-November. I wish to commend staff, the members of the Board of Trustees, County Presidents and Delegates for the excellent response we enjoyed. More than 300 physicians were present. Our Tort Reform program began with great enthusiasm. Physicians of South Carolina contributed more than $190,000 to the effort which is now underway.

The tragic death of our President, Dr. Leonard Douglas, made it necessary to elect a President-Elect. This election was carried out at the conclusion of the interim House of Delegates meeting in November. I am proud and privileged to have been elected to the position which I now occupy. At the time of my election, Dr. Marion Burton assumed the office of Speaker of the House of Delegates.

As President-Elect, since mid-November, I have been extremely active. I have attended all Board of Trustees and Executive Committee meetings. Other numerous meetings with officers and staff have been held in addition. I have made several television appearances on behalf of the SCMA efforts, made three county society visitations, and have addressed civic and community clubs. I have testified on four occasions before the legislature. I have held several press conferences. I have met with representatives of the federal government with regards to Senator Hatch's Tort Reform proposals from Congress.

Please allow me to describe in somewhat more detail two things which I have done. First I have attended two sessions of the American Medical Association, in Washington, D. C., in December and in Chicago in February. I wish to point out to the House of Delegates how enormously impressed I was with the AMA House of Delegates and its actions. I think that any physician who would attend one of these meetings would be amazed, as I was, at the breadth and depth of activities in which AMA is involved in representing and supporting the medical profession in this country. AMA is indeed viable, active, powerful; it is indeed working continuously in our behalf; it does indeed deserve our financial, vocal and moral support.

Second, our Tort Reform effort — at the time of this writing — is viable, but is being attacked vociferously by a segment of the Bar Association, the Trial Lawyers Association. We are also confronted by subtle delaying tactics within the legislature, I feel. Much of this delay is perhaps understandable and is done in the name of careful approach to a serious question, but the result is delay, nonetheless. I am still very hopeful that some meaningful change in the tort system can be accomplished to allow physicians of South Carolina to continue to provide for the citizens of South Carolina the accessibility and affordability of medical care which we desire and which our patients deserve.

Finally, allow me to comment on our relationship to DHEC. During the last several weeks, our Legislative Activities Committee, headed by Dr. Frank Young of Lexington, has voted to oppose an item of legislation advanced by DHEC with respect to licensure and regulation of renal dialysis centers. Hearings have been held on several occasions and at one of these I testified. This hearing, as it turned out, resulted in a veritable confrontation between DHEC and SCMA and the result was counterproductive to both organiza-

tions. I have spoken privately with the head of DHEC, my friend Dr. Bob Jackson. I have told Dr. Jackson that I think such a confrontation — and it is not accurate to call it anything less — suggests an adversarial position which need not and should not exist. If we have differences with the proposals of DHEC, or any other state or federal agency, it is my sincere hope and my full intention to see that reasonable compromises are reached prior to legislative or public hearings. We will then give the public outside of medicine the assurance that we are working within medicine for the welfare of the public.

I humbly appreciate the opportunity you have given me to serve as President-Elect and pledge to you my continued commitment towards the aims of SCMA.

Respectfully submitted,
Walter J. Roberts, Jr., M.D.,
President-Elect

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REPORT OF THE EDITOR OF *THE JOURNAL*

The editorial philosophy of our Journal — one of the oldest of its kind — can be found in the Information for Authors in the February issue. We believe that journals such as ours continue to have a unique role. We strongly encourage articles written by practicing physicians. We also welcome information uniquely pertinent to the health of South Carolinians. We welcome review articles by full-time faculty members, but discourage original scientific articles by the latter group of contributors since these should ordinarily be published in one or another national or specialty journal.

I thank the members of our Editorial Board and also the many reviewers who have critiqued manuscripts and made suggestions for improvements. Without their assistance, we could not meet our goal of making *The Journal* a well-refereed periodical.

At our annual meeting at this year, the Editorial Board will review our procedure for soliciting and approving special symposium issues. We believe that such issues improve the quality of *The Journal* and address the needs of our readership.

I would again like to thank our Managing Editor, Joy Drennen, who does a truly herculean job. She single-handedly carries out the many functions for which many journals maintain large office staffs!

Again, it has been a privilege to serve as editor of *The Journal.*

Respectfully submitted,
Charles S. Bryan, M.D., Editor

REPORT OF TRUSTEE, FIRST MEDICAL DISTRICT

In my first year as Trustee from the First District, I have had a good opportunity to see the inner workings of our organization and to get more actively involved on a personal basis. It has been a busy year with our Special Meeting of the House of Delegates and our major legislative effort on Tort Reform. I have met with our legislators on several occasions as well as at the Public Hearing of the Senate Judiciary Committee on Tort Reform in Columbia. I do not like the legislative process, but we as physicians need to work in it to protect the interests of our patients and our profession.

Many important issues face the medical community: medical liability and Tort Reform, alternative methods of health care delivery and reimbursement, the growing monopoly of Blue Cross/Blue Shield, and others. These problems are not going to be solved or disappear this year. Many of you have gotten involved in one of them, e.g. the Physicians' HMO, and I applaud your efforts and encourage you to continue. Unfortunately, our greatest enemy is not the big insurance companies, the new HMOs or PPOs, the S. C. legislature, the federal government, or even the plaintiff lawyers. Our greatest enemy is physician apathy. Too few of us belong to the SCMA and AMA, and even fewer of us really participate in our medical society at any level. We all realize that one must find time to do the things that are important. Your profession, the AMA, SCMA, and local medical society, as well as your specialty society, are important and need your participation and input. If you are not a member, please join. If you are not active, please get involved. If you are not giving something back to your community, now is a good time to begin.

I appreciate the opportunity of serving this year as Trustee, and I welcome any suggestions that you might have for ways in which the SCMA can be of better service to you and your patients.

J. Chris Hawk, III, M.D., Trustee

REPORT OF TRUSTEE, FIRST MEDICAL DISTRICT

This has been my first year to serve as the First Medical District's representative to the South Carolina Medical Association Board of Trustees. We have tried to visit with all of our county societies in the First District. Colleton County was fortunate to have Dr. Leonard Douglas meet with them before his tragic death. The biggest issue that we have dealt with in our county meetings this year has been Tort Reform. Every physician in our district has been encouraged to become familiar with our bill and encourage the legislators in their community to support our bill. We would like to congratulate Dorchester County for their successful reorganization efforts this year. They have sent out new application forms to all members and so far have 69 members. We will continue to work to encourage the new Dorchester County members that are not members of SCMA to join us. They have elected their delegates for the SCMA meeting and will be joining us this year.

I represented the South Carolina Medical Association at the AMA Legislative Council meeting in Chicago in February to discuss our Resolution 34 regarding restructuring the Medicare law. This resolution was passed at our Annual Meeting last year and then was taken to the AMA by our delegates. The AMA was receptive to our suggestions and I feel we will see the AMA moving to improve the Medicare situation.

Thank you for allowing me to serve as your representative on the SCMA Board of Trustees and if you need any help in the future, I hope you will feel free to call upon me.

Respectfully submitted,
Daniel W. Brake, M.D., Trustee

REPORT OF TRUSTEE, SECOND MEDICAL DISTRICT

Members of the House of Delegates, constituents. This last year has been a busy one with Board meetings, Alternate Health Care Delivery Committee meetings, Tort Reform meetings and liaison role between the Board and my county medical society. Information obtained from some committees on the Board was very helpful in preparing our county medical society for the advent of HMO activities and efforts on the part of Blue Cross/Blue Shield in our area.

I have looked forward to serving on the Board for the past three terms and with regrets, step down from that position as your Board member. I hope to remain active in committee assignments for SCMA.

Respectfully submitted,
Jack L. Ratliff, M.D., Trustee

REPORT OF TRUSTEE, THIRD MEDICAL DISTRICT

Your Third District Trustee has attended most of the Board of Trustees meetings in Columbia. Your Trustee has also attended the Greenwood County Society Meeting with Dr. Appleby representing the South Carolina Medical Association and also the Abbeville Society meeting with Dr. Charles Duncan. We have been in touch with the Laurens/Newberry Societies by letter and telephone.

We have participated in the Governor's Task Force on Prescription Drug Abuse. Most recently, we have attended the opening hearings of the Senate Judiciary Committee on the subject of tort reform, specifically the bill sponsored by the South Carolina Medical Association.

There has been much activity in the Third District in regards to PPOs and HMOs. We have been trying to keep our societies informed as well as possible on their options in regards to these activities.

I wish to thank the members of the Third District for the opportunity of serving as Trustee and look forward to continued service in their behalf.

Respectfully submitted,
Richard M. Carter, M.D., Trustee

REPORT OF TRUSTEE, FOURTH MEDICAL DISTRICT

Since April, 1985 your Trustee has attended all of the SCMA Board of Trustees meetings, including the meeting in April in Charleston.

Other activities have included largely legislative activities, though I did not attend the Legislative Activities Committee meetings routinely. I have been active in dialogue with a number of the legislators in the South Carolina General Assembly throughout the year regarding Tort Reform and other issues pertaining to medicine. Included in this is attendance at a reception for Senator Vern Smith; a roasting of Senator Nell Smith; and a luncheon with our county delegation and others in August, primarily in formulating the Tort Reform Bill that we are attempting to have passed and in an effort to get sponsorship. We were successful in regards to getting it sponsored appropriately. It remains to be seen how well we do with passing it, though it appears favorable at this time.

I have also attended the Anderson County Medical Society meetings on one or two occasions, but have not been able to attend the Oconee County Medical society meetings as yet.

Your Trustee is also a member of the South Carolina Medical Care Foundation and its Executive Committee, and I have attended their meetings on a regular basis, as well as a number of telephone conferences.

Respectfully submitted,
William J. Goudelock, M.D., Trustee

REPORT OF TRUSTEE, FIFTH MEDICAL DISTRICT

The past year has been a very interesting, exciting and educational one for me. This being my first year to serve on the Board, it has given me the opportunity of meeting many fine physicians in this organization. I was very saddened by the untimely death of our President, Leonard Douglas, but feel the leadership of the SCMA has done a remarkable job of continuing to move forward.

Within our district, I attended meetings of the Lancaster, Chester and Fairfield County Medical Societies. Our newly elected President-elect, Walter Roberts, along with Bill Mahon, spoke at the

York County Medical Society meeting in January. I hope I have the opportunity to attend the Lancaster and Kershaw County Medical meetings during the coming year. Although the SCMA membership from our district still is not nearly 100 percent, we do seem to be making progress. In agreement with the rest of the SCMA leadership, I think it is of utmost importance that we have a large membership with the SCMA.

On a statewide basis, the medical malpractice situation has taken a considerable amount of time and effort of many busy physicians. In order to be successful, we still must have the involvement of more physicians in talking to their legislators, as well as their patients and friends. I was pleased at the attendance we had at the special meeting of the House of Delegates in November and was pleased with the attendance for the public hearing on the medical malpractice bill in February.

I want to take this opportunity to express my appreciation in being allowed to serve on the Board of Trustees and hope that I can adequately serve my district. I would appreciate hearing from anyone who would like to express their thoughts or has an issue they would like brought to the attention of the SCMA.

Respectfully submitted,
Terry Dodge, M.D., Trustee

REPORT OF TRUSTEE, SEVENTH MEDICAL DISTRICT

I appreciate the opportunity to serve you as your South Carolina Medical Association Trustee for another two-year term and thank you for your confidence in re-electing me.

It has been another busy and interesting year. Many items are brought before your Board, too numerous to discuss in this report. Rest assured each issue is discussed in-depth. Highlights include the Tort Reform legislation the Association is pushing for passage this year. You have all received much information on this and I hope have done your part in educating the public and discussing the legislation with your delegation. Changes in the public's attitude is a must in changing the present situation.

Another highlight is the passage last spring of the resolution opposing the hazardous waste landfill located on the shores of Lake Marion. We also need your delegation's support of this legislation.

Our Risk Management Seminars have been a big success and if you haven't taken part in them, I encourage you to do so in the future.

The untimely death of our friend and President, Leonard Douglas, M.D., was a shock I am sure to you as it was to me. It was a great loss to the South Carolina Medical Association. We are all extremely thankful for the availability and capability of his successor, Gavin Appleby, M.D. Dr. Appleby has done a yeoman's job in taking over immediately without missing a step.

Again, let me thank you for your confidence and support in serving as your Trustee. I request your input and assistance at any time. I need your guidance so that I can know your desires and represent you better.

Respectfully submitted,
S. Perry Davis, M.D., Trustee

REPORT OF TRUSTEES, EIGHTH MEDICAL DISTRICT

With the Annual SCMA Meeting in Charleston, I will have completed my first full two-year term as Trustee from the Eighth Medical District. I have attended all Board meetings, since my election, as well as the Special Meeting of the House of Delegates.

On January 22, 1986, the Edisto Medical Society was honored by the attendance of the SCMA President, Dr. Gavin Appleby, and the Executive Vice President, Mr. Bill Mahon. Dr. Appleby spoke on the structure of the SCMA and Mr. Mahon answered questions on the day-to-day operation of the organization.

I have repeated my offer to the component societies of the Eighth District and their delegates to attend their meetings and answer questions on actions taken by the Board of Trustees.

Since becoming a Trustee, and as a direct result of becoming a Trustee, I have been appointed to the SCMA Members' Insurance Trust Board and to the Governor's Primary Health Care Committee. I have attended all SCMA MIT Board meetings and the only meeting of the Governor's Primary Health Care Committee held since my appointment.

I remain an advisor to the Perinatal and Maternal Health Committee of the SCMA and have attended all but one of this committee's meetings.

The Edisto Medical Society has nominated me

for a second term as Trustee, and I shall be pleased to serve should the Eighth District delegates concur at the Annual Meeting.

Respectfully submitted,
John W. Rheney, Jr., M.D., Trustee

REPORT OF TRUSTEE, NINTH MEDICAL DISTRICT

This has been a busy and productive year for the Ninth Medical District. Of paramount importance has been our concern for Tort Reform legislation and the urgent need for legislative action. Our members have been busy contacting our legislators, who will have a strong voice in the necessary revamping of existing laws.

Dr. Jack Evans and Dr. Frank Weir were elected to the Medical Disciplinary Commission from our district. These two outstanding physicians are committed to representing the doctors in this state in a most professional manner and will make many contributions in this important area.

In January of this year, Lieutenant Governor Mike Daniel was speaker at the annual banquet of the Spartanburg County Medical Society. Over 250 persons were in attendance, including representatives of the SCMA.

In our district, several doctors have been elected to important national and state offices. Dr. Robert Taylor is currently President-Elect of the American Academy of Family Physicians. Dr. Mack Poole has been elected as Chairman of the Board of Directors of the South Carolina Academy of Family Physicians. Dr. William Hendrix has been honored as the South Carolina Family Physician of the year. Dr. Hendrix has been involved in many community and professional activities over the years.

The Spartanburg County Medical Society has been involved in discussions with area hospital administrators regarding media advertising. The society feels such discussions are necessary to avoid an "advertising war" and to keep such advertising in the best interest of the public which we serve.

Finally, I want to thank the physicians in my district for allowing me the privilege of serving as Trustee.

Respectfully submitted,
J. Sidney Fulmer, M.D., Trustee

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- **Neurologist**
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COMMITTEE REPORTS

ALCOHOL, DRUG ABUSE AND IMPAIRED PHYSICIANS COMMITTEE

The Alcohol, Drug Abuse and Impaired Physicians Committee continues to offer help to fellow physicians who are in trouble with alcohol, drugs or other impairment.

The Committee was instrumental in getting insurance coverage for alcohol, drugs and psychiatric disorders. This is a step forward since in the past, treatment was solely the responsibility of the physician who had problems.

This year the Committee has set up treatment teams for the nine medical districts in the State. The team members are very active and doing an outstanding job.

The Committee is involved with helping the Impaired Nurses' and Impaired Veterinarians' Associations establish a working program with their respective associations.

An Intervention Workshop was held on February 15-16, 1986, at the Ocean View Recovery Center. The Workshop was led by Ms. Bonnie Fargnoli, Mr. Skip Runge and Mr. Joseph Hall, and was a big success. Some of the committee members would like for this to become an annual event.

The committee chairman was invited to speak at the Risk Management Seminar held February 5, 1986, in Columbia.

The Committee studied the AMA Model Impaired Physician Treatment Act, and believes that SCMA should recommend enactment for implementation.

The Committee is still spending time promoting our services to the county societies and auxiliaries as well as the hospital administrators.

I wish to thank the committee members and the SCMA staff for their support during the past year.

Respectfully submitted,
Douglas F. Crane, M.D., Chairman

ALTERNATE DELIVERY SYSTEMS COMMITTEE

The Alternate Delivery Systems Committee met on October 17, 1985, for a called meeting to respond to a letter from Dr. Bart Barone in Charleston regarding the establishment of a statewide IPA HMO. At this meeting, we moved, seconded and approved that the South Carolina Medical Association respond to inquiries from physicians encouraging them to review the action of the 1985 House of Delegates Meeting and establish organizations that would conform with these recommendations. Further, that the South Carolina Medical Association should encourage networking among organizations under the SCMA, and that a contract advisory service should be established by the SCMA to respond to questions physicians might have about IPA, HMO or PPO contracts.

To reaffirm the SCMA's stand on Alternative Health Care Delivery Systems, the committee felt that there were three basic principles involved: 1) that all alternative health care delivery systems should be under the direct control of local physicians; 2) that they should employ an open panel concept; 3) in areas where adequate resources were not available, to establish an IPA or HMO affiliation with such an organization in a larger community should be considered.

Respectfully submitted,
H. Earle Russell, Jr., M.D., Chairman

JOINT COMMITTEE ON CARDIAC REHABILITATION, SOUTH CAROLINA MEDICAL ASSOCIATION AND SOUTH CAROLINA HEART ASSOCIATION

The committee organized on site inspection teams and carried out inspections of the six programs currently operating in the state. Two year certification has been granted to five programs: 1) Greenville General Hospital CRP; 2) Charleston CRP (Medical University of South Carolina and The Citadel); 3) McLeod Regional Center, CRP, at Florence; 4) University of South Carolina CRP at Columbia; 5) Spartanburg CRP (limited to Phase II).

The New Life CRP at Providence Hospital, Columbia, was granted provisional certification in October, 1985 and will be reinspected.

The Joint Committee has recommended provisional certification of a cardiac rehabilitation program at Marion Memorial Hospital effective February 24, 1986.

The present criteria for certification states that the program personnel shall have attended a workshop on cardiac rehabilitation. A symposium and workshop on this subject was held by the Charleston program in October, 1985. The Joint Committee will meet this spring to discuss plans for regularly scheduled workshops in South Carolina for persons interested in beginning a new program. At present there are two programs per year in North Carolina which can be attended by interested persons from South Carolina.

Respectfully submitted,
William H. Barnwell, M.D., Chairman

CONTINUING MEDICAL EDUCATION COMMITTEE

The committee was responsible for four major tasks: (1) to plan the scientific program for the Annual Meeting of the Association; (2) to plan and manage the fall CME course at Hilton Head; (3) to develop new policies and procedures for accreditation of intrastate providers of continuing medical education; and (4) to conduct a self-survey for accreditation of the SCMA as a provider of CME.

The scientific program for the Annual Meeting was planned to follow a format similar to previous recent years. The first of two general sessions will be on Cardiology and will be moderated by Dr. J. O'Neal Humphries, Dean and Chairman of Internal Medicine at USC School of Medicine. Speakers include Dr. Sol Sherry of Philadelphia, Dr. James Spann of Charleston, Dr. Thomas Hearon of Columbia and Dr. Joe Utley of Spartanburg. The second general session will be on Infectious Diseases and will be moderated by Dr. James C. Allen, Professor and Chairman of Internal Medicine at MUSC. Speakers for this session include Dr. Donald Armstrong of New York, Dr. John Rullan of DHEC in Columbia, Dr. Charles Bryan of Columbia and Dr. Glenn Geelhoed of Washington, DC. In addition, fourteen two-hour workshops will be offered on a wide variety of topics. Total CME credit hours offered are 55, and any one physician can attend as many as 22 hours.

The third annual Review and Update in Medicine sponsored by SCIMER was presented at Hilton Head in September. More than 100 physicians attended, and, according to participant evaluations, the meeting was highly successful. For the Association, it also proved to be a financial success. Plans are being made for the fourth annual meeting at the Mariner's Inn, September 22-29, 1986. This meeting will be managed totally by SCIMER without using direct staff support from the Association.

The Accreditation Council for Continuing Medical Education (ACCME) will survey the Association on May 22, 1986, to review its role as accrediting agency for CME in the state. New policies, procedures and essentials have been adopted by the ACCME in recent years, necessitating revision of the SCMA policies and procedures regulating intrastate accreditation of CME. Under the new "essentials," all organizations (including the SCMA) which offer CME credit must have a written CME mission statement, conduct needs assessment, written educational objectives for all activities and conduct evaluation of all activities. In addition, all jointly

sponsored (co-sponsored) activities must meet the same guidelines, and the institution offering credit must be involved at all levels of program planning and carrying out of the activity.

The new policies and procedures for accreditation will substantially change the manner in which CME credit is offered in South Carolina. The purpose of these changes is to assure that all CME activities meet certain educational standards. The ultimate effect will be better, more thoughtfully planned CME activities for South Carolina physicians.

Respectfully submitted,
James M. Long, III, M.D., Chairman

LONG RANGE PLANNING COMMITTEE

The Long Range Planning Committee has initiated the task of assessing the progress being made in implementing the strategic plan which was adopted by the House of Delegates in 1984. This plan is a four year plan and once the assessment is complete the Committee will begin to address the elements of a plan to be implemented in 1988.

It is too early in the evaluation process to report on the progress being made, but I anticipate that next year a full and comprehensive report will be available.

Respectfully submitted,
Kenneth N. Owens, M.D., Chairman

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SCMA NEWSLETTER

April, 1986

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ANNUAL MEETING UPDATE

Included in this issue of *The Journal* are Reports and Resolutions to be considered at the 138th Annual Meeting of the South Carolina Medical Association, to be held April 23 - 27, 1986 at the Sheraton Charleston Hotel. Mailing of handbooks to Delegates is scheduled for the second week in April. Those Delegates who find they will be unable to attend are urged to pass their handbooks along to their Alternate Delegates, since only a very limited supply will be available at the meeting.

As of March 26, a total of 206 physicians have pre-registered.

SCMA *President, J. Gavin Appleby, M. D.*, has selected as the recipient of the President's Award for 1986 *Mrs. Wayne C. (Billie) Brady*, former President of the American Medical Association Auxiliary from Greenville. In announcing his selection, Dr. Appleby cited Mrs. Brady as *"representing the true spirit and strength of the SCMA Auxiliary, ... and she is the epitome of how much it contributes to medical leadership in South Carolina."* The award will be presented at the President's banquet on Saturday evening, April 26.

Howard K. Nankin, M. D., Professor and Director of the Division of Endocrinology/ Metabolism at the USC School of Medicine, has been chosen as the winner of the Thomas A. and Shirley W. Roe Award for the best article published in *The Journal* by an institution-based physician for the period 1984-1985. His article which appeared in the August, 1985 issue, titled "An Approach to Treating Severe Osteopenia," was selected by *Arnold S. Relman, M. D., Editor, The New England Journal of Medicine.* The award will be presented in the SCMA House of Delegates on Sunday, April 27.

Contrary to previous information, the new SCMA Awards for Excellence in Health Promotion, co-sponsored with the Governor's Council on Physical Fitness, will not, in all likelihood, be presented at this year's Annual Meeting. The deadline for nominations was extended by the Governor's Council, and the new time frame will not allow for appropriate arrangements in time for the Annual Meeting. Instead, the Awards will be presented at ceremonies in the Governor's Office, followed by a luncheon in honor of the winners.

John C. Hawk, Jr., M. D., nominated by the Charleston County Medical Society, will be presented the A. H. Robins' Physician's Award for Community Service at the President's Banquet. Congratulations also to the other physicians nominated as follows: *T. James Bell, M. D., Darlington; Joseph W. Taber, Jr., M. D., Columbia; Jennings K. Owens, M. D., Marlboro;* and *Harold Morse, M. D., Anderson.*

MEDICARE REIMBURSEMENT

Some time this month (April, 1986), all physicians who see Medicare patients are expected to receive a detailed letter from their carrier outlining new reimbursement provisions that become effective May 1.

The precise timing of the mailings can't be determined since the President has not yet signed the 1986 Budget Reconciliation Act into law. He is expected to do so as this *Newsletter* goes to press.

Following are highlights of the definitive reimbursement - status information that will be communicated in the carrier letter:

- There will be a special enrollment period through April that will permit all physicians to alter their current "participating" or "non-participating" status.

- The current freeze on prevailing and customary charges will remain in effect through April 30.

- Physicians who are currently "participating" will receive upgrades in BOTH their prevailing and customary fees beginning May 1.

- Formerly participating physicians who elected to become non-participating this fiscal year will be permitted upgrades, effective May 1, in their customary charges ONLY.

- Fees for those physicians who have always been non-participating will continue to be frozen through calendar year 1986. This freeze will be terminated for all services rendered on or after January 1, 1987.

- Beginning January 1, 1987, reasonable charge screens and participation agreements will be effective on that date. As of October 1, 1986, there will be no participation/termination opportunity for 1987.

- Starting January 1, 1987, customary charges of both participating and non-participating physicians will be updated for services rendered then or thereafter. The prevailing charge differential between participating and non-participating physicians, however, will remain continuous.

- *Any physician wishing to change his or her present participating/non-participating decision must do so in writing by April 30. Otherwise no communication is necessary.*

Attachments to the letter will include a participation agreement form and a comprehensive fact sheet on the Participation Program, presented in a question and answer format.

AMA PUBLICATIONS

The SCMA has received several inquiries regarding obtaining copies of AMA publications, particularly the CPT code book update. We have been advised that credit card orders for AMA publications now may be made using a toll-free phone number: (800) 621-8335. Additional information, including lists of available publications and bulk order prices, may be obtained by writing to the AMA Customer Service Department, 535 N. Dearborn, Chicago, Ill. 60610.

PHYSICIANS CAUTIONED REGARDING "LIVING WILL"

The recent enactment of the Living Will legislation poses particular problems for physicians. SCMA attorneys have reviewed the new law and strongly recommend that physicians not advise patients regarding living wills. Under the new statute, this advice could possibly be construed as coercion, and murder charges could possibly be brought against the physician. A penalty also exists if false or misleading information results in withdrawing life support systems.

What is false and misleading or what constitutes coercion is open to interpretation of the courts, and physicians are advised to avoid all situations where living wills are being discussed by your patients. If a patient approaches you regarding a living will, refer them to a family member or attorney.

SCSO LEGISLATOR OF THE YEAR

The South Carolina Society of Ophthalmology has selected *Senator J. Verne Smith* of Greer as its "Legislator of the Year" for the 1985 Session of the General Assembly of South Carolina.

In making the award presentation, Charles R. Duncan, Jr., M. D., President of the Society, praised Senator Smith for his "unparalleled commitment and dedicated service to the health care needs of the citizens of South Carolina." Dr. Duncan noted that Senator Smith in his position as Chairman of the Senate Medical Affairs Committee had led the fight for the passage of the important Medically Indigent Assistance Act. Duncan also applauded Smith for his numerous contributions "in preserving high standards for the delivery of quality medical care from physicians in South Carolina."

Senator Smith is married to the former Jean Myers of Simpsonville and they have two children.

SCMA EXECUTIVE DIRECTOR RESIGNS

It was announced at the last meeting of the SCMA Board of Trustees that *Mr. William L. Watson*, Executive Director, had resigned effective in mid-May. Mr. Watson will be returning to Chicago where he lived and worked for many years, and where his daughters currently reside.

The SCMA membership, leaders and staff send with *"Killer"* their best wishes for his continued success in the future.

SUBSIDIARY BOARD MEMBERS ELECTED

The SCMA Board of Trustees has elected or re-elected members of SCMA subsidiary Boards as follows:

Members' Insurance Trust: *Edward C. Mattison, M. D.*
S. C. Medical Building, Inc.: *Harrison L. Peeples, M. D., Harold E. Fleming, M. D.*
S. C. Medical Care Foundation: *Robert Moxon, M. D., William Barnwell, II, M. D., Julius Hedden, M. D.*
SCIMER: *Euta M. Colvin, M. D., Harrison L. Peeples, M. D., Sidney Fulmer, M. D., Mrs. Mary Anne Douglas, Susznne Black, M. D., James Long, M. D., Ben Miller, M. D., Rion Dixon, M. D., Charles Bryan, M. D., Randolph Smoak, M. D., C. Tucker Weston, M. D., Walter J. Roberts, Jr., M. D.*

GET THE ANSWERS CAMPAIGN

Response to the SCMA mailing of "Get The Answers" posters and brochures has been very favorable, with requests being received for additional copies. The "Get The Answers" campaign was designed to make your patients aware they should ask questions about their prescription drugs so that they may understand and follow your instructions. If you find you need additional copies, contact SCMA Headquarters. A limited supply is still available.

GROWING, GROWING, GROWING...

Membership in the SCMA continues to grow at an unprecedented rate. At the end of March, active membership was 7.5 percent ahead of the previous year, and total members (all categories) was up more than eight percent.

A record number of political action contributors (AMPAC/SOCPAC) has already been achieved and the gifts to AMA-ERF are at an all-time high.

The following comparison demonstrates our progress over a year ago:

	March 31, 1986	March 31, 1985
Active	2,360	2,210
Affiliate	4	2
First Year Physicians	32	11
Honorary	226	197
TOTAL	2,622	2,420
Students	67	10
Interns/Residents	63	115
GRAND TOTAL	2,752	2,545

We can do better -- please ask a non-member colleague to join. There has never been a greater need for members to be involved in the SCMA's goals and objectives!

CAPSULES...

...*William T. Hendrix, M. D., of Spartanburg,* has been chosen as the 1986 Family Physician of the Year by the S. C. Academy of Family Physicians. Dr. Hendrix is a charter member of the Academy and was instrumental in organizing the South Carolina Chapter. He is a past president of the state chapter.

....Honorary membership status has been granted to *H. Rawling Pratt-Thomas, M. D.; James T. McElrath, M. D.; Ronald V. Ledford, M. D.; John C. Scurry, M. D.; A. Elbert Adams, M. D.; John D. Harrison, M. D.; R. Cathcart Smith, M. D.; and J. William Pitts, Sr., M. D.*

Anne Dibila-Wright, M. D., and *William Felber, M. D.,* have recently been appointed to the Alcohol, Drub Abuse and Impaired Physicians Committee, in an effort to further strengthen the Regional Treatment teams.

MEDIATION COMMITTEE

The Mediation Committee of the South Carolina Medical Association has not found it necessary to meet during the past twelve months. This is an indication of the growing number of component medical societies with very efficient and active Grievance Committees, who are capably handling complaints that originate within their jurisdiction. Currently, 26 out of a total of 40 medical societies have active grievance committees.

Twelve complaints came to our Committee last year, this being three less than last year. All were referred to the respective component societies; and all were satisfied by the component society.

Respectfully submitted,
William L. Meehan, M.D., Chairman

MEDICAL ASPECTS OF SPORTS COMMITTEE

With the millions of sports fans in America, it is no surprise that the Medical Aspects of Sports continues to grow as a highly visible and popular program not only in South Carolina, but throughout the nation.

At the Sports Medicine Seminar during the 1985 Annual Meeting, six outstanding speakers, all with expertise in their subject material, presented an exceptional program. Not only was the medical community involved, but also trainers, coaches, nutritionists and others who are devoted to improving the health and well-being of all athletic events attended and the program received an excellent rating.

This year, the Medical Aspects of Sports Committee is attempting an entirely different, and perhaps novel program. One of America's foremost authorities on sports medicine will deliver the entire program. Stephen G. Rice, M.D., Ph.D., Developer and Director of the Division of Sports Medicine at the University of Washington in Seattle, will discuss "Athletic Medicine and Injury Control" on Friday afternoon, April 25, 1986, at the Sheraton-Charleston. The program will be open to all interested or involved with sports medicine.

The Medical Aspects of Sports Committee has continued to promote and sponsor mini-clinics for coaches and trainers locally. The services of the committee are available to any county or municipality interested in staging a clinic.

Since the approval of the Athletic Trainers Act in 1984, the committee has recommended that all high schools in the state (both public and private) should make every effort to have a certified athletic trainer present at all athletic events (contact sports). This matter is presently under study to determine ways and means to have it implemented.

One other subject under consideration is boxing — both amateur and professional. Members of the South Carolina Boxing Commission have met with the Medical Aspects of Sports Committee seeking assistance from physicians as well as the SCMA to improve the sport in the state and to have a physician in attendance at all boxing matches (professional and amateur). New regulations have been formulated, but the entire matter is still under consideration.

An effort is being made to work more closely with the South Carolina High School League to determine how the committee and the League may be mutually helpful.

The next meeting of the Medical Aspects of Sports Committee will be on Friday morning, April 25.

Respectfully submitted,
W. Ray Henderson, M.D., Chairman

MEMORIAL COMMITTEE

Honored tradition has deemed it just and proper that the Medical Association of South Carolina halt its proceedings to pay honor to our departed brothers, physician members of this Association.

The practice of medicine is of the highest calling and is one of the oldest professions. It emulates the Great Physician who both taught and healed. This is our mission and duty.

I submit that these physicians, whose names follow, by their skill in the practice of medicine, by their devotion to duty, and by their concern for the human relationships involved, have earned an honored place in the hearts of their patients, their families, their friends and the members of this Association.

I ask you to stand while their names are read

and afterward for a few moments of silent prayer in their honor. Dr. Walter Hastings, Greenville; Dr. James B. Watson, Columbia; Dr. Edward E. McClaren, Greenville; Dr. Lawrence H. Erdman, Columbia; Dr. Walter D. Hastings, Jr., Spartanburg; Dr. Leonard W. Douglas, Belton; Dr. P. G. Jenkins, Charleston; Dr. Charles H. White, Sr., Sumter; Dr. Von A. Long, Newberry; Dr. Louis Grandin Llewelyn, Lancaster; Dr. William Leslie Yetter, Hilton Head Island; Dr. John C. Aull, Charleston; Dr. Walter R. Wiley, Chesterfield; Dr. William R. Craig, Jr., Greenville; Dr. J. B. Massey, Charleston; Dr. Robert Wilson, Charleston; Dr. William Keefer Brumbach, Gaffney; Dr. Imants A. Ceips, Ridge Springs; Dr. C. A. Mitchell, Seneca; Dr. Willis Keen Mylin, Charleston; Dr. Ronald Doyle Russell, Pelzer; Dr. John Perry Miles, Jr., Greenville; Dr. Lonita Boggs, Greenville; Dr. Peter J. Botzis, Columbia; Dr. Sedgwick Simmons, Charleston; Dr. Roderick Macdonald, Rock Hill; Dr. Gerald Elledge McDaniel, Columbia; Dr. J. F. Daniel, Greenwood; Dr. William S. Caudell, Columbia; Dr. Marion Lee Peeples, Jr., Greer; Dr. Morris S. Young, Anderson.

Respectfully submitted,
William L. Perry, M.D., Chairman

MENTAL HEALTH COMMITTEE

The Committee on Mental Health has become increasingly active in dealing with mental health issues of our patients in the state of South Carolina. During this year, committee members have been represented on the Governor's Legislative Committee to deal with new commitment law reform recommendations and have been able to influence the proceedings in a way to hopefully help both physicians and their patients. The committee was active in influencing the process of selection of the new Commissioner of Mental Health, and the committee is pleased with the open spirit that the new Commissioner has concerning working with the South Carolina Medical Association to provide a first class level of mental health for all citizens of our state. The committee has also had preliminary discussions with the Committee on Alcohol, Drug Abuse and Impaired Physicians to hold educational programs for our medical students to discuss the stress and pressure that they will encounter, both for themselves and for their families as their careers progress. During the next year, a great number of important mental health issues will come before the legislature and it is hoped that we can continue to influence these bills for the good of our patients and fellow physicians.

Respectfully submitted,
Richard K. Harding, M.D., Chairman

OCCUPATIONAL MEDICINE COMMITTEE

The SCMA Committee on Occupational Medicine had quarterly meetings during 1985. *The Schedule of Fees for Physicians and Surgeons for Services Rendered Under the South Carolina Worker's Compensation Law* was not completely updated during the year, but did receive an extensive review and evaluation. Several hundred deletions and additions were made in the fee schedule as well as unit value changes for certain procedures that seemed appropriate. Countless hours were contributed to this effort by all 14 members of the committee, and the results are obvious in the fee schedule revision you should have received by the time you read this report.

In March, 1985, the committee recommended to the Industrial Commission an increase in the conversion factors for services rendered under the South Carolina Worker's Compensation Law. Even though it had been three years since the last conversion factor increases had been approved by the Industrial Commission, the Commission did not act upon the committee's recommendation until after a public hearing was scheduled and held on August 12, 1985. This hearing was attended by Bill Mahon and the committee's chairman as SCMA representatives. Several letters from persons opposing the conversion factor increases were read at the hearing, and a representative of industry from the Charleston area spoke in opposition to the conversion factor increases. At a later date the Industrial Commission saw fit to grant the conversion factor increases precisely as recommended by this committee and the increases became effective as of November 1, 1985, as published in the October, 1985 issue of *The Journal of the South Carolina Medical Association*.

Physician's fees which seemed inappropriate to the Medical Department of the Industrial Com-

mission were reviewed at each meeting and recommendations were made to the Industrial Commission on an individual case basis. The committee also made recommendations to the Commission on several occasions regarding the appropriateness of bills for services rendered by paramedical practitioners.

The committee hosted dinner meetings with the entire Industrial Commission twice during the year. As usual, these meetings prompted very frank and very productive discussions of our mutual problems and concerns relating to the best possible medical care for South Carolina's injured workers at the lowest possible cost compatible with good medical care.

Members of the committee participated in the planning of two meetings conducted by the Industrial Commission. The first of these was the Annual Educational Conference held in Columbia in September, 1985, and the second was the Medical Seminar held in Hilton Head in March, 1986. Both meetings were well attended and very worthwhile.

In summary, this has been another busy year for the committee in fulfilling its role as liaison between the South Carolina Medical Association and the South Carolina Industrial Commission, and as a resource group to the Commission as it attempts to fairly administer the Worker's Compensation Law of the State of South Carolina.

Respectfully submitted,
Walter G. Coker, M.D., Chairman

PEER REVIEW COMMITTEE

The Peer Review Committee was formed in July 1985 when three separate committees (Quality Assurance, Professional Review and Insurance Peer Review) merged. The Committee (and specialty-specific subcommittees) is a statewide committee composed of over 50 practicing physicians from all primary and many specialty disciplines. The Committee's charge is to perform quality of care review, utilization review, and advisory peer review of insurance claim disputes.

The Committee and subcommittees met each month from July to October when all further meetings were temporarily suspended due to the termination of the Medicare Peer Review Organization (PRO) contract.

Respectfully submitted,
Robert N. Milling, M.D., Chairman

PERINATAL AND MATERNAL HEALTH COMMITTEE

The Perinatal and Maternal Health Committee continues to investigate maternal mortalities. The Committee is still working on protocols for investigating infant mortalities.

The Committee is pleased to announce that the "Request for Waiver" for the Medically Needy Program was passed by the Federal Government. A representative from the Department of Health and Environmental Control thanked the Committee members for all the hard work and long hours they put into getting the Waiver passed.

During the last year the Committee had the opportunity to comment on two bills; one was H. 2827 regarding Amendment of Title 44 to provide for the licensing and regulations of birthing centers. The Committee stood behind its original statement, that they oppose free standing birthing centers, and felt they should be hospital based only. The other Bill was H. 2829, the South Carolina Health Services Act For School Aged Children. The Committee went on record as supporting this Bill.

The Committee continues to support sex education courses in the schools. The Committee members would like to reiterate the availability of videotapes of the film series "Growing Up," which the committee produced.

The Committee was asked by the Department of Health and Environmental Control to study whether or not Alpha-feto Protein Screening should be done routinely on all pregnant women. A sub-committee was appointed by the co-chairmen to obtain pilot data and other information on the subject. This study is still under way.

We would like to thank the committee members and the SCMA staff for their support this past year.

Respectfully submitted,
Tom L. Austin, M.D., Co-Chairman
Hal R. Rubel, M.D., Co-Chairman

PRIMARY CARE/MEDICAID AND INDIGENT CARE COMMITTEE

The Primary Care/Medicaid and Indigent Care Committee has met at approximately six week intervals this year. Some of the functions of the committee were very well summarized in the January *Journal of the South Carolina Medical Association* by Dr. Bill Hester.

One of the major foci of this committee this year was to develop a packet of material to help local physicians develop free clinics for indigents. The Anderson Clinic was used as a model and input was obtained from both medical and non-medical leaders in Anderson. This packet has been sent to the South Carolina Medical Association Board of Trustees for approval and distribution.

We have continued to work closely with staff of Health and Human Services Finance Commission. Many problems with Medicaid have been resolved. Physician reimbursement has been greatly improved. Examples of this are $14 for a limited office call and $450 for total OB care. Another small increase may be anticipated this year. Limitations on the number of hospital days and office visits for Medicaid patients were removed this year. These improvements were made possible by more generous appropriations from the legislature. We have continued our custom of reporting to the members of the House Ways and Means Committee annually. Their interest is that more physicians participate in the Medicaid program so that all the poor citizens of South Carolina will be medically served. This committee strongly urges all members of the South Carolina Medical Association to participate in the Medicaid program. We feel that many of the previous objections to the program have been eliminated. Reimbursement is timely and much improved over previous years.

We have received several complaints during the year about Medicaid audits of doctors' offices. These have been discussed with officials from HHSFC and efforts are underway to improve this process.

Respectfully submitted,
Benjamin E. Nicholson, M.D., Chairman

PROFESSIONAL LIABILITY COMMITTEE AND RISK MANAGEMENT SUBCOMMITTEE

The Professional Liability Committee met in July, 1985 to discuss the proposed Tort Reform legislation that had been planned. Various aspects of the bill were discussed in considerable detail and some changes were suggested. The approved version of the bill by the committee was submitted to the South Carolina Medical Association Board of Trustees for action and subsequent referral to the Legislative Committee for action in getting the bill introduced in the legislature. The Professional Liability Committee remains strongly supportive of the final bill that has been introduced, but expresses the hope that no more compromises or deletions will be made. The full committee will next meet during the Annual Meeting in Charleston on Friday, April 25, 1986, at 9:30 a.m.

The Subcommittee on Risk Management has been very active by doing the following: (1) Continued publication of the quarterly Risk Management Bulletin. (2) A Risk Management meeting for Georgetown and Horry counties in October, 1985. Dr. Roland Skinner and Dr. Bill Fairey were primarily responsible for arranging and promoting this meeting. (3) Telephone conference in November, 1985 for an overall review of activities and plans for a statewide meeting was held. (4) A meeting was held in October, 1985 with a committee of JUA defense attorneys and a committee of physicians to discuss the defense of damaged baby suits. Dr. Sal Rini was very active in this meeting and as a result of the meeting, the SCMA with assistance from the JUA will begin building a library of files related to the defense of suits with pertinent information as to the plaintiff, expert witnesses, etc. Also the assistance of the defense attorneys and defense medical witnesses will be coordinated in all cases in the state. (5) A seminar on Risk Management was held in Columbia on February 5, 1986, with approximately 250 attendees. Dr. Jim Todd of the AMA was our keynote speaker. A full range of subjects relating to professional liability was presented during the day long meeting. (6) The Risk Management Meeting at

the Annual Meeting will feature Donald Palmisano, M.D., who was with us in 1984. This program will be on Saturday, April 26, 1986, at 2:30 p.m.

Respectfully submitted,
Euta M. Colvin, M.D., Chairman

PUBLIC RELATIONS COMMITTEE

The Public Relations Committee of the SCMA has been extremely active during the 1985-86 year. A change in the Public Relation consultant resulted in the employment of RESH Advertising, Inc.

I. *Annual Meeting, 1985:* Public relations for the annual meeting resulted in an increased number of both print and broadcast journalists being involved. With the change in the Board of Medical Examiners dictated by the Supreme Court, there was marked increase in the exposure of the SCMA during the annual meeting.

II. *Tort Reform:* As the Tort Reform legislation has been proposed during the past year, the PR Committee and consultants have been active in providing strategy for this work. RESH Advertising has spent a major effort with the Professional Liability Committee, the Board of Trustees and the Executive Committee in preparing the strategy and implementation in order to achieve Tort Reform. Press releases, position papers, and press conferences have provided outstanding coverage by both broadcast and print media. The SCMA position has continually been proactive, bringing forth areas of concern for all South Carolinians.

III. *Presidential Activities:* Consultants have worked diligently in a tour of newspaper editors with Dr. Leonard Douglas and then repeated much of the same activity with Dr. Gavin Appleby. This has increased the exposure of the SCMA embodied in its leaders with various newspaper editors. In addition, a major effort has gone into the production of an audiovisual package, utilizing slides which effectively discuss the SCMA with those unfamiliar with the organization. This has proven extremely helpful to both Drs. Douglas and Appleby. The SCMA staff and PR consultant were utilized heavily at the death of Dr. Leonard Douglas. These efforts continued through the change to Dr. Appleby as President and then with the election of Dr. Walter Roberts as President-elect.

IV. *Awards:* With the interest shown in the Journalism Award given over the last two years, the committee has divided the Journalism Award into an award for print media as well as one for broadcast media. Additionally, the awards will be announced and provided to the journalists at the meeting of their profession. This will enhance the reputation of the winners and provide recognition for them among their peers. The winners will then be introduced and recognized at the annual meeting of the SCMA as was done previously.

A new award will be provided for this year. The Corporate Health Award will be given for contributions from the World of Business. It will be given in conjunction with the Governor's Council on Physical Fitness.

V. *Public Service Announcements:* Activity in this area has continued from previous years. Ten PSA's have been written for radio on issues of health as well as safety in the home. These are provided for continued name recognition. Three PSA's have been written for television. In the Christmas season, a PSA on holiday drinking and driving was given widespread usage throughout the state. In addition, two PSA's have been written regarding use of seat belts and the use of helmets by motorcycle riders. These have been written in conjunction with the Governor's Committee on Employment of the Handicapped. They also have responded to resolutions passed at the last annual meeting of the SCMA.

VI. Other use of the Public Relations Committee and principally the Public Relations consultant included an effort to assure the reelection of Dr. John Hawk to the AMA Council on Constitution and Bylaws, and to further publicize seminars on Sports Medicine, Child Abuse and Risk Management.

VII. *Future Plans:* In addition to continuing the activities already mentioned, future plans

include training seminars for speakers. Those who feel the need for additional training in public speaking will be able to participate in an educational activity to acquire expertise. Further efforts are planned in interactions with government agencies, both legislative and executive, as with the two Governor's councils this year. Further efforts at communication with the governing institutions will be essential following the effort at Tort Reform. It is also anticipated that better communication and influence of the SCMA should occur with other health care institutions such as the South Carolina Hospital Association, South Carolina Nurses Association, etc. It is also anticipated that SCMA activity and support for health care financing programs as developed will require significant support from the Public Relations Committee.

I wish to thank the members of the association and in particular the members of the committee for dedicated and hard work throughout the past year. In particular, the entire SCMA can express its gratitude for strenuous and excellent efforts in the public relations field from RESH Advertising, Inc., in particular Mr. Hal Von Nessen, Mr. Chuck Luce, and Mr. David White.

Sincerely,
James L. Haynes, M.D.,
Chairman, Public Relations Committee

SCMA/SCNA JOINT LIAISON COMMITTEE

Since the last Medical Association convention, our committee has met three times. At the first meeting, on May 29, child abuse and the Governor's Task Force on Prescription Drug Abuse were discussed and representatives concerning both of these issues were requested to be present at the next meeting.

The next meeting, on September 25, we had Shirley Fritz-ritson from the Department of Social Services, who gave a very interesting and informative report concerning child abuse activities in this state. This was followed by a presentation by Mr. Bill Belvin from the South Carolina Commission on Alcohol and Drug Abuse, who was in charge of the Governor's Task Force for Prescription Drug Abuse. He stated that this particular task force was coming to an end and our committee offered any assistance that we could provide in continuing some sort of activity in this particular direction. At this meeting, Silvia Whiting was elected Vice-Chairman to chair the committee in case the chairman could not make it.

The last meeting was held in January, 1986 and present at this meeting was Susie Nickles, Manager, Health Policy Affairs for the South Carolina Medical Association. She presented the Tort Reform bill to the committee and the support of the Nurses' Association was asked for and this will be taken to their board at their next meeting. We expect to get official support from that organization. Also, it was decided to ask Marion Burton, Speaker of the House of Delegates, if a time slot could be made available at the Annual Meeting of the SCMA to have the Nurses' Association give an update of what was happening in nursing. Also, staff was asked to make a request of Dr. Appleby (or the presiding President of the SCMA) to speak at the Nurses' Association convention in November at Hilton Head.

Physician attendance at this particular committee was somewhat better than last year, however, still not very good.

Respectfully submitted,
James M. Lindsey, M.D., Chairman

LIASON COMMITTEE TO THE SOUTH CAROLINA VOCATIONAL REHABILITATION DEPARTMENT — DISABILITY DETERMINATION DIVISION

The Liaison Committee to the South Carolina Vocational Rehabilitation Department Disability Determination Division met on August 4, 1985, with the Disability Determination Division of the South Carolina Vocational Rehabilitation Department represented by Mr. Rick Vandiver, Director; Mr. Honer; Mr. Lussieu; and Mr. Kelly, Regional Directors respectively of Columbia, Charleston and Greenville, South Carolina.

The committee was informed of and made aware of the following information affecting the physicians of South Carolina and their patients: that the moratorium placed into effect on the recall of certain disability recipients would be lifted in January, 1986, and that a change in the method of recall would in effect avert the problems encountered in the previous recall and reexamination of recipients to the Social Security system. A face to face interview with recipients would be made prior to adverse determinations and prior to the recipient having to proceed through the federal court for relief. Psychiatric cases would be reviewed and adjudicated with the assistance of a psychiatrist which, in our opinion, represented a giant step forward in their efforts to properly adjudicate such cases. The problem involved in the adjudication of chronic pain was actively being investigated by the Social Security Administration, but with no firm decisions as of that time.

The committee has pledged to continue in its efforts to interface with the Vocation Rehabilitation Department for the benefit of the physicians of South Carolina and their patients.

Mr. Vandiver has assured the committee that it will, in the near future, attempt to resubmit various changes that were placed into effect in January, 1986, and that he will, at that time, attempt to clarify the impact that these changes will have upon the physicians and their patients.

It was also indicated that he (Mr. Vandiver) will attempt to place articles in *The Journal of the South Carolina Medical Association* periodically in an effort to aid us in keeping abreast of such changes.

Respectfully submitted,
Belton D. Caughman, M.D., Chairman

SOUTH CAROLINA INSTITUTE FOR MEDICAL EDUCATION AND RESEARCH

The SCIMER Board met during the summer to discuss several matters that will be more formally addressed at the next meeting in April, 1986. The activities during the past year and proposals for additional ones are as follows:

1. The Review and Update Meeting in September at Hilton Head was very successful in 1985. There has been considerable confusion regarding the responsibility for this meeting, but I am confident that this has all been cleared and SCIMER will put on the meeting in 1986 and in subsequent years.

2. The first recipient of the Scholarship Award for funds left to the SCMA by Dr. Stuckey will be selected this spring.

3. A memorial fund for Leonard Douglas, M.D., was established and funds have been and are being received. The specific uses for this fund will be discussed at the April, 1986 meeting.

4. We are following up on the idea of creating a research award and a clinical award for medical students from our two schools. This is also on the agenda for the April meeting.

5. The Roe Foundation funds are administered through the SCIMER and the next award will be made at the Annual Meeting.

6. The SCIMER Board welcomes your contributions as memorials and will appreciate your comments and suggestions about the activities of the South Carolina Institute for Medical Education and Research.

Respectfully submitted,
Euta M. Colvin, M.D., President

SOUTH CAROLINA MEDICAL CARE FOUNDATION

The South Carolina Medical Care Foundation experienced a successful year during 1985 in performing utilization and quality review for Medicare, Medicaid and private companies in South Carolina. After ten years of experience and reputation as the premiere review organization in the country, however, the Foundation also experienced increasing frustrations with the ever changing and burdensome federal administration of the PRO program. Finally, when faced with a request in October to re-validate 150,000 hospital bills within 30 days, the Foundation's Board of Directors concluded that it was necessary to cancel our PRO contract.

The Foundation has recently re-submitted a proposal to once again become the South Carolina PRO with the anticipation that the appointment of Otis Bowen, M.D., as Secretary of DHHS will address the problems experienced with DHHS in 1985 by renewing medical leadership of the PRO program. The status of PRO in South Carolina should be concluded prior to the Annual Meeting. In the event that the South Carolina Medical Care Foundation does not resume Medicare review, the Foundation will continue to perform other review at the request of the Medicaid state agency, private companies, hospitals and insurance companies.

Respectfully submitted,
Halsted M. Stone, M.D., President

REPORT OF THE SOUTH CAROLINA MEDICAL BUILDING, INC.

January of 1986 completes our first full year in the new SCMA Building at I-26 and St. Andrews Road, and the building has adequately met our needs. For those of you that have not had an opportunity to visit the headquarters, we would encourage you to do so at your convenience.

The Building Corporation was able to pay a dividend of $25,000 to the SCMA which is the only stockholder in the Building Corporation. The termination of the PRO contract has reduced the data processing activity to the lowest level in eight years.

The Board of Directors is currently evaluating what the future role of the Building Corporation should be in the overall SCMA organization.

I would like to thank all of the Board members and the SCMA staff for their support this past year.

Respectfully submitted,
Harrison L. Peeples, M.D., President

SCMA MEMBERS' INSURANCE TRUST

The SCMA Members' Insurance Trust has completed another year of providing for members of the SCMA, their families and office staff a comprehensive health insurance program. The conversion to an age banded rate structure last year was completed smoothly, as well as the change in our servicing carrier from Blue Cross to Provident Life and Accident. The Trust has renewed the contract with Provident for another year.

This year there will be no increase in premiums even though benefits were expanded to provide broader psychiatric coverage. The Trust is operating on a fiscally sound basis and is maintaining adequate reserves to cover any unforeseen contingency.

I would like to express my sincere appreciation to the members of the Board and the SCMA staff for their hard work this past year.

Respectfully submitted,
Edward Mattison, M.D., President

SOUTH CAROLINA POLITICAL ACTION COMMITTEE

In 1984, the Board of Directors of SOCPAC decided that we would have just one major membership category — sustaining. Sustaining members contribute a total of $100 — $50 is used for statewide elections and $50 is transmitted to AMPAC for use in congressional campaigns.

Although it was the collective opinion of the SOCPAC Board that membership might show a slight decrease, the increased contributions would more than offset a decline in membership. It was also thought that membership would increase after the first year.

Although membership did decline in 1985 by approximately 50 members, the amount of money raised by our joint solicitation (SOCPAC and AMPAC) increased by more than $12,000 — the largest single year increase in the history of the pac movement.

Our predictions for a stronger membership year in 1986 developed early and continued to impress all of us who have watched the membership statistics annually. As of the end of January, we had surpassed the entire 1985 membership and are certainly headed for an all-time record. At the time this report is being prepared we have nearly 550 AMPAC/SOCPAC members and have surpassed our 1985 income by some $14,000.

Some of you may recall that in 1984, we did not have sufficient funds to participate in all of the political campaigns which deserved our support. It caused SOCPAC to wait until the new membership solicitation started to have enough money to help certain candidates with campaign deficits. That problem will not exist in 1986.

Without question, the greatest responsibility of the SOCPAC Board of Directors is the stewardship of our member's contributions. We must accumulate all information available from many sources to be reasonably certain that your dollar is spent wisely. We know before we start that we will make some mistakes, but the goal is to keep mistakes to a minimum and maximize our good support decisions. This is not determined by the number of victorious campaigns — many could select 50 campaigns in our state and predict the correct result in all 50. The degree of success depends on supporting the candidate where the outcome is in considerable doubt, or changing an unfriendly seat to a more compatible circumstance.

We must all keep in mind that political action is perhaps the best long range program ever devised for organized medicine. We will try to be highly visible in 1986 and begin to plan our long range goals for the future where changes require considerably more effort.

In the 1986 elections, we will be better prepared than we have ever been to make that impact. To those who have supported political action now and in the past we say "thank you." If any are not yet a member — we welcome you and solicit your support.

Respectfully submitted,
Randolph D. Smoak, Jr., M.D.,
Chairman, SOCPAC Board

SPECIAL REPORT OF THE DELEGATION TO THE AMERICAN MEDICAL ASSOCIATION

As I pause to reflect on the activities of the South Carolina Medical Association during the last 25 years, I wish to express my grateful appreciation to the physicians of South Carolina, and the members of the South Carolina Medical Association for allowing me the privilege of serving you in the various capacities over these years. Back when I first served as a delegate to the meetings at the old Ocean Forest Hotel, the SCMA was a very loosely knit medical organization concerned with the scientific sessions and much socializing at the State Convention. The President was the presiding officer at the State Convention and there were less problems being considered in the business session than there are at the present time. Since that time, the administrative office has moved from Florence to Columbia and we have had our headquarters building since 1975. At present, the building is completely debt free and serving the Association and its affiliated organizations well. There was an administrative reorganization in 1974 prior to moving into our own building.

The SCMA has been reorganized again and we have a headquarters that is functioning efficiently and serving all of the physicians of the state in an excellent fashion. The fifteen years that I have served as an alternate delegate (seven) and delegate (eight), we have increased our representation from two delegates to three and also the members of the Executive Committee of the South Carolina Medical Association Board of Trustees are attending the AMA Convention, giving us a full delegation which represents South Carolina well at the National level. This has enabled us to develop close ties with the elective leadership within the AMA with many of the recent Presidents and staff executives (Dr. James Sammons and Dr. James Todd) visiting us in South Carolina and at our conventions.

We have been successful in placing SCMA physicians in leadership positions at the AMA. Dr. John C. Hawk, Jr., is Vice Chairman of the AMA Council on Constitution and Bylaws; and Dr. Randolph D. Smoak, Jr., is a member of the Board of AMPAC.

Many of our local society Presidents or President-Elects attend the Leadership Conference in February each year which is of immense value. The hospital staff section has recently been organized and we are attempting to get more and more of our South Carolina hospital staff represented at these meetings for the two days prior to the opening of the AMA sessions.

It has been a heartwarming and most satisfying experience for me to have had the opportunity to participate in a leadership role during these exciting times in the history of the South Carolina Medical Association. As I step down as a delegate, I am confident that the outstanding and effective leaders that you have selected to represent you at the AMA level and lead the South Carolina Medical Association will continue to bring more and more members and provide excellent service to all the physicians of the state. All of us at the present moment are working very diligently to effect real reform in the legislative halls during this session. I call upon all physicians in South Carolina to join the Medical Association and put their shoulders to the wheel in contacting their local legislators to get this job accomplished.

JOIN THE SCMA, JOIN SOCPAC, JOIN AMA, JOIN YOUR LOCAL MEDICAL SOCIETY, GET INVOLVED — YOU CAN MAKE A DIFFERENCE.

With sincere thanks,
C. Tucker Weston, M.D.,
Former AMA Delegate

RESOLUTIONS

SUBMITTED BY: *Spartanburg County Medical Society*
SUBJECT: **BLUE CROSS/BLUE SHIELD CONFLICT OF INTEREST**

WHEREAS, Blue Cross/Blue Shield of South Carolina has a contract to serve as fiscal intermediary for the Medicare program for all physicians in South Carolina; and

WHEREAS, Blue Cross/Blue Shield of South Carolina has a contract to serve as fiscal intermediary for the Medicare program for all hospitals in South Carolina; and

WHEREAS, Blue Cross/Blue Shield of South Carolina has a contract to serve as fiscal intermediary for the Medicare program for all nursing homes in South Carolina; and

WHEREAS, Blue Cross/Blue Shield of South Carolina has been tentatively designated as the Regional Intermediary for all home health agencies in the states of Kentucky, Tennessee, North Carolina and South Carolina; and

WHEREAS, Blue Cross/Blue Shield of South Carolina has been tentatively designated as the Regional Intermediary for all DME suppliers; and

WHEREAS, Blue Cross/Blue Shield of South Carolina provides private insurance to citizens of South Carolina and has a major share of the private insurance market; and

WHEREAS, Blue Cross/Blue Shield of South Carolina has a contract to provide health insurance benefits to all state employees and teachers in South Carolina; and

WHEREAS, Blue Cross/Blue Shield of South Carolina has recently entered into the market as a provider of services through its ownership of a home health agency in Myrtle Beach and a statewide health maintenance organization; and

WHEREAS, As a participant in the provider market, Blue Cross/Blue Shield of South Carolina is in direct competition with other providers of services in South Carolina as to which it serves as fiscal agent; and

WHEREAS, The activities of Blue Cross/Blue Shield of South Carolina have resulted in Blue Cross/Blue Shield of South Carolina having an unprecedented influence on the provision of health care services in the State of South Carolina;

NOW THEREFORE, Be it resolved that it is the view of the South Carolina Medical Association that the dual role of Blue Cross/Blue Shield of South Carolina as Medicare fiscal agent and as a provider of health care services constitutes a conflict of interest;

AND BE IT FURTHER RESOLVED, That the South Carolina Medical Association urges that the Health Care Financing Administration require Blue Cross/Blue Shield of South Carolina to divest itself of all activities as a provider, directly or indirectly, of medical services as a condition of HCFA contracting with Blue Cross/Blue Shield of South Carolina as a fiscal agent for the Medicare program, and further that HCFA withdraw its contracts with Blue Cross/Blue Shield of South Carolina as fiscal agent for Medicare in the event that Blue Cross/Blue Shield of South Carolina fails to divest itself of its provider activities.

SUBMITTED BY: *Charleston County Medical Society*
SUBJECT: **MONOPOLISTIC CONTROL BY BLUE CROSS/BLUE SHIELD OF THE HEALTH CARE INDUSTRY IN SOUTH CAROLINA**

WHEREAS, the Charleston County Medical Society endorses and supports the Resolution of the Spartanburg County Medical Society concerning the monopolistic control by Blue Cross/Blue Shield of the health care industry in South Carolina; and

WHEREAS, Blue Cross/Blue Shield is arranging additional preferred provider contracts (Preferred Personal Care) with a limited number of hospitals in the state excluding competing hospitals in which licensed physicians practice, thus further increasing this insurance company's monopolistic control of health care in South Carolina; and

WHEREAS, Blue Cross/Blue Shield enjoys economic advantage over other health insurance

companies doing business within the state because of its special tax status;

NOW THEREFORE, be it resolved that the Charleston County Medical Society requests the South Carolina Medical Association to condemn the additional monopolistic market power enjoyed by Blue Cross/Blue Shield through its Preferred Personal Care contracts and special tax status and urges the Association to study and implement action to reduce this insurance entity's control over health care in South Carolina.

SUBMITTED BY: *Charleston County Medical Society*
SUBJECT: **BLUE CROSS' PREFERRED PERSONAL CARE CONTRACTS OFFERED TO AREA HOSPITALS**

WHEREAS, the Preferred Personal Care contract recently offered by Blue Cross to certain hospitals in the Charleston area contains an "Exclusive Arrangement" clause, specifying that the Plan will not enter into a similar arrangement with more than one hospital within a 25 mile radius; and

WHEREAS, this "Exclusive Arrangement" clause can prove highly detrimental to the previously cordial and cooperative relationships between hospitals in the Charleston area; can serve as a divisive force among members of the Charleston County Medical Society who care for patients in more than one hospital; and may work a distinct hardship on individual patients by denying them equal access to the hospital of their choice;

NOW THEREFORE, be it resolved that the Charleston County Medical Society strongly urge that any hospitals which have signed or are considering the signing of contracts with the Blue Cross PPC demand that Blue Cross-Preferred Personal Care remove the "Exclusive Arrangement" clause from all current and future contracts.

SUBMITTED BY: *Charleston County Medical Society*
SUBJECT: **TAX EXEMPT BENEFIT FOR HEALTH INSURANCE**

WHEREAS, economists agree that the major abnormal mechanism prevailing in health care financing is the separation of the act of consumption of services from a responsibility for payment for services; and

WHEREAS, in 1985 consumers paid only 29% of personal health care while government paid for 48% and business and industry paid for 29% through provision of tax-free supplements of health care benefits; and

WHEREAS, those funds which are employer-based pass to third parties, giving those entities an unnecessary and expensive role in health care funding; and

WHEREAS, the existence of tax-free subsidies to income in the form of health care benefits to the employed discriminates against the poor and unemployed in that those persons are excluded from group health coverage so that government cannot purchase coverage for them; and

WHEREAS, the federal government now exempts health care benefits from taxation; and

WHEREAS, the American Medical Association favors a limited taxation of health care benefits (making taxable any employer contribution greater than $70 per month per individual or $165 per month per family).

NOW, THEREFORE, be it resolved that the Charleston County Medical Society favors elimination of the tax exemption for health care benefits; and

BE IT FURTHER RESOLVED, that the Society submit this resolution to the South Carolina Medical Association with a request that it be adopted and referred to the American Medical Association.

FINANCIAL CHECKUP

MARTIN LEFKOWITZ
Certified Financial Planner
Tax Shelter Co-Ordinator: E.F. Hutton

Vol. 6, Issue No. 4 April 1986

HOW TO BUY LIFE INSURANCE

Before You Buy.....

If you shop for universal life insurance you'll probably be shown a computer printout or ledger sheet which will project how much your cash value and death benefit will grow over the next 25 to 50 years. These projections are affected by two key variables: mortality costs and the interest rate paid on cash value in the policy. This is, however, where the buyer should beware. Some insurance companies offer very high interest rates which look attractive, but the cost of the insurance is so high that you're really not making any more. On the other hand, some insurance companies will "buy" new business with high initial interest rates and low insurance costs with no intention of holding to either one of them.

That's why it is important to understand the assumptions upon which the projections you receive are made. If you are not comfortable with the assumptions being used, ask your agent or broker to adjust them to your comfort level. In this age of the personal computer, this is a very simple task.

The major difference between traditional whole life and universal life is flexibility. Life insurance companies are not in business to make long term guarantees which may lose them money, hence the low guarantees of traditional whole life. Universal life allows you, the insured to keep pace with current interest rates and mortality costs while allowing the insurance company to avoid painting itself into a corner.

Universal Appeal

To give you an idea of how dramatic the universal life revolution has been, consider the following:

1. Universal life sales in 1984 surged to $179 billion worth of face amount, more than double the previous year's figure of $86.5 billion.

2. Net premiums for universal life were $4.1 billion in 1984 - up from $1.4 billion in 1983. Why did premiums triple while face amount only doubled? Simple - people have discovered that a universal life insurance policy is an excellent savings vehicle.

And where does E.F. Hutton fit into this picture? Besides being the originator of universal life, our life insurance subsidiary - Hutton Life - finished 1984 in fifth place (out of 314) in the nation for universal life insurance in force, with $10.4 billion of face amount on the books. In terms of direct premiums, Hutton Life was third in the nation in 1984 following only New York Life and Annuity and Metropolitan Insurance and Annuity.

The important thing is to recognize that the face of the life insurance industry has changed dramatically in recent years. If you haven't had a recent analysis of your life insurance program, you owe it to yourself to do so. You may find that you can obtain the same coverage you presently have at at lower cost or much greater coverage at the same cost. Or if you have avioded life insurance because you didn't consider it a "good investment," perhaps it is time for you to look at what Hutton Life calls "Life Insurance from an Investor's Point of View."

ARE YOU PREPARED TO FINANCE A COLLEGE EDUCATION?

A lesson in prefunding might keep you from learning the answer the hard way.

Higher education. Its value is no longer strictly academic. By the time your three-year-old enrolls in college, the cost may be beyond your imagination. And your child's educational advancement could prove to be a financial setback for you. Unless you plan ahead.

Today, the total cost of a private four-year university averages $10,000 per year, and is rising faster than the rate of inflation. In fact, by the year 2000 - the year your child may be reaching college age - this cost could well exceed $30,000, and require a total expenditure of as much as $123,500.*

How can you meet this expense? You have several alternatives. You may, conceivably, choose to pay it as it occurs out of your current cash flow. However, if writing checks that size is more than you can manage, you may decide to assume a second mortgage, sell the house altogether or borrow the funds from your local savings and loan at the prevailing rate of interest...Or, you can prefund.

Basically, prefunding may be accomplished by one of two methods: lump sum or annual accumulation. Under the lump-sum method, a dollar amount would be set aside today which, under normal growth, would be sufficient to meet all future education expenses as they occur. Under the annual accumulation method, predetermined yearly deposits are made to a fund. This amount must be sufficient to generate adequate cash for any given year's projected education expenditure.

To see what this means, let's look at an example. The Websters have two children, ages two and five. Both children will attend a four-year private college that presently costs $10,000 per year. By the year 2005 - when both children have completed college - the Websters' expenditure will have totaled more than $251,600 (given our 7% annual inflation rate scenario). By opting to prefund this expense, the Websters' outlay would be reduced to $50,000 in one lump sum, or annual contributions approximating $6,500 (assuming a 10% annual growth rate).

More attractively, prefunding not only provides an excellent way to save for an education, but to realize important tax savings as well. That's because most prefunding plans are based on the idea of "income shifting": the transfer of investment income from high income tax bracket parents (or grandparents) to children, or trusts in lower brackets. Income shifting enables you to accumulate funds in a tax-advantaged manner. It is usually accomplished through either of two popular funding vehicles. To find out what these two vehicles are, tune in next month.

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The information contained herein has been obtained from sources believed reliable, but is not necessarily complete and cannot be guaranteed. Any opinions expressed are subject to change without notice. Neither the information presented nor any opinion expressed constitutes a representation by us or a solicitation of the purchase or sale of any securities. South Carolina Medical Association and E.F. Hutton & Company, Inc. 1986.

If you would like to receive further information on any of the topics covered in this newsletter, please write to Martin Lefkowitz, CFP, E.F. Hutton & Company, Inc. 2700 Middleburg Drive, Suite 200, Columbia, SC 29204: or Call (800) 922-1112.

*Assuming a 7% inflation factor on education costs.

OLD BUSINESS

POSTPONED DEFINITELY SCMA CONSTITUTION FROM THE 1985 HOUSE OF DELEGATES

The following proposed amendments to the SCMA Constitution were presented at the 1985 Session of the House of Delegates and have thereby been postponed definitely for the required eleven (11) months prior to final action by the House of Delegates. This is presented for final approval at the 1986 Session as follows:

The Constitution as adopted named the members of the Board of Trustees. It was felt more appropriate for the Bylaws to outline the composition of the Board of Trustees and recommended that Section 3.00, lines 32 through 38 be deleted and a line added to read "The composition of the Board of Trustees will be as outlined in the Bylaws."

Section 8.00, line 63. Place a period after the word "REFERENDUM" and delete the words thereafter through line 66, which would make Section 8.00 read as follows: 8.00 REFERENDUM. The House of Delegates may, by a two-thirds (⅔) vote of registered members order a general referendum. If the members voting shall comprise a majority of all the regular members of the Association, a majority of such vote shall determine the questions and be binding upon the House of Delegates.

Respectfully submitted,
O. Marion Burton, M.D.,
Speaker of the House of Delegates

EXHIBITORS FOR SCMA 1986 ANNUAL MEETING

1. & 2. Compudata Professional Systems LTD
3. Parke-Davis
4. Fenwick Hall Hospital
5. Winchester Surgical Supply Company
6. DuPont Pharmaceuticals
7. Office of Recruitment, Retention and Placement
8. U. S. Air Force Health Professions
9. Smith Kline & French Laboratories
10. Knoll Pharmaceuticals
11. The Upjohn Company
12. G. Geisler Group
13. Medical Marketing Enterprises
14. Members Insurance Trust
15. Hoechst-Roussel Pharmaceuticals, Inc.
16. Carolina Hyperbarics
17. The Devereux Foundation — Georgia Branch
18. Children's Hospital at RMH: Comprehensive Hemophilia Center
19. Children's Hospital at RMH: Cancer Treatment and Research
20. Bureau of Laboratories — DHEC
21. McNeil Consumer Products Company
22., 23. & 24. Companion Technologies — Blue Cross/Blue Shield of SC
25. Bristol Laboratories
26. Lederle Labs
27. I. C. Systems, Inc.
28. Ortho Pharmaceutical Corporation
29. U. S. Army Professional Support Agency
30. Commercial Services, Inc.
31., 32. & 33. CompuSystems, Inc.
34. McNeil Pharmaceutical
35. American Red Cross, S. C. Regional Transplantation Services
36. Pfizer Laboratories
37. MUSC Office of Alumni Affairs
38. & 39. Southern Medical Association
40. Metpath, Inc.
41. Thorne & Thornton Partnership
42. Abbott Laboratories
43. E. R. Squibb and Sons, Inc.
44. Mead Johnson Nutritional Division
45. H. Jack Free Advisory Corporation
46. Roche Biomedical Laboratories, Inc.
47. Wyeth Laboratories
48. S. C. Vocational Rehabilitation Department
49. Merck Sharp & Dohme
50. Home Health Services — DHEC
51. The Medical Protective Company
52. Sandoz Pharmaceuticals
53. E. F. Hutton & Company
54. Auratech
55. Wallace Laboratories
56. William H. Rorer, Inc.
57. Miles Pharmaceuticals
58. Acta-Fax Business Machines



SPECIAL GUEST: AMERICAN MEDICAL ASSOCIATION HARRISON L. ROGERS, JR., M.D., PRESIDENT

Harrison L. Rogers, Jr., M.D., a general surgeon from Atlanta, Georgia, became President of the American Medical Association at its Annual Meeting in June, 1985.

Doctor Rogers, elected as Vice Speaker of the AMA House of Delegates in June, 1977, served as its Speaker from 1981-84. Long active in the Medical Association of Georgia, he has served in many capacities including Vice Speaker and then Speaker of its House of Delegates, member of its Board of Trustees and chairman of several committees. In 1981, Doctor Rogers received the Distinguished Service Award from the Medical Association of Georgia.

Doctor Rogers was a Regional Delegate to the American Hospital Association House of Delegates from 1974 to 1982.

Born in Cumberland, Maryland, on October 25, 1923, Doctor Rogers served in the U. S. Army 1943-46. He received his M.D. degree from Emory University Medical School in 1952 and is a Past President of its Alumni Association. In 1980, he was elected as alumnus member of the Emory Chapter of Alpha Omega Alpha honorary fraternity. In 1983, he was presented with the Award of Honor by Emory University Medical Alumni Association.

Doctor Rogers interned at Yale, and served his residency at Boston Veterans Administration Hospital. He is a Diplomate of the American Board of Surgery and a Fellow of the American College of Surgeons.

Doctor Rogers is currently a Clinical Assistant Professor in the Department of Surgery at Emory and is on the active and teaching staffs of Crawford Long and Piedmont Hospitals. Doctor Rogers is a charter member of the Southeastern Speakers Association, a former member of the American Red Cross Board of Directors, Past President of the Atlanta Clinical Society, and a former member of the Board of Directors and Treasurer of Blue Shield of Georgia/Atlanta.

Doctor Rogers and his wife, Jean, have four children, Harrison III, Theodosia, Ellen and Michael.

Editorial

VICTIMS

The need for meaningful tort reform legislation ranks high among this year's priorities. Senator Hugh Leatherman of Florence introduced a bill to limit the amount of compensation an injured party could receive for pain and suffering and also to limit the fees of plaintiff's attorneys. As this issue goes to press (March 10, 1986), the outcome of this bill remains unclear. However, debate over the merits of the bill has already dramatized differences of opinion between our organization and that of the plaintiff's attorneys.

On February 25, approximately 100 members of our association attended a hearing before the Senate Judiciary Committee. They were outnumbered not only by members of the opposing South Carolina Trial Lawyers Association, but also by members of a newly-organized group known as COLLAR (Citizens Opposed to the Limitation of Legal Rights). These persons wore buttons proclaiming "I am a VICTIM," and some wore colorful red sashes marked "VICTIM." It seemed reasonable to assume that the COLLAR group was in fact organized by the trial lawyers, who wore buttons proclaiming "I represent victims." Once more, they demonstrated their ability to pluck the chords of sympathy.

With tongue in cheek, I suggest that the scenario in the Senate chambers did indeed reflect reality: there are more victims than doctors. My dictionary defines a victim as "someone . . . killed, . . . injured, or otherwise harmed by, or suffering from, some act, condition, agency, or circumstance." In the last analysis, all of us are victimized by that terminal condition known as *life*. On the way to our graves, most of us will suffer injuries of one kind or another and will find cause to be disappointed in our doctors if we expect perfect solutions. It seems safe to assume that some of the "victims" at the state house did indeed suffer from medical negligence, but also that others simply sustained a bad result for which no one was really at fault. All fractures do not heal favorably; all deliveries do not proceed uneventfully. More and more, one hears the complaint that "it seems the Good Lord has run out of malpractice insurance!"

Medicine remains an art as well as a science. No artist can guarantee that each portrait will be a perfect likeness. Further, every artist will have an occasional bad day. Does this entitle the embarrassed and dissatisfied portrait sitter to demand compensation surpassing the earnings of the poor artist? Given the size of some recent judgments in South Carolina and elsewhere, the analogy may be only slightly far-fetched. The physicians testifying before the Senate Judiciary Committee freely acknowledged the existence of medical malpractice but, as Dr. Thomas Rowland put it, urged that "there must be a reasonable limit on these awards."

Who are the real victims? They include young physicians who finish training and find their ability to enter practice severely limited by the high premiums. They include patients who must pay higher fees to offset physicians' high cost of practice, in turn due to the high premiums. In short, they include all of us.

We, too, sympathize with those members of COLLAR who may have had legitimate grievances. We, too, can sympathize with the argument that the contingency fee system for tort liability litigation has been "the poor man's key to the courthouse door." However, one can argue that only the trial lawyers are non-victims in a system that limits the size of neither awards nor of attorneys' fees and thereby becomes "just about anybody's key to the national treasury."

In at least two ways, the issue of tort reform far transcends the problem of malpractice liability insurance. First, medical practice is hardly the only profession or enterprise plagued by rising liability premiums (ask just about anyone at your service club!). Second, the issue poses for all citizens the question of how much society as a whole should pay to protect the rights of its members. We recall the Supreme Court's recent decision that even the Miranda ruling must have practical limits. The rights of individuals, however precious we may hold them, must be carefully weighed against the rights of society as a whole.

The scenario at the state house reminds us of the need for *all* physicians to support the efforts of organized medicine to bring about meaningful tort reform legislation. Preparing for our 138th annual meeting, we again point out the need for all of us to *become involved*.

— CSB

ON THE COVER:
JOHN LAWRENCE ANCRUM, M.D., 1839-1900

In 1894, the Annual Meeting of the South Carolina Medical Association was held in Rock Hill. The President of the Association that year was John L. Ancrum, M.D. Dr. Ancrum presided over the South Carolina Medical Association some years after his return from duties in the Confederate Navy. Dr. Ancrum was a graduate of the College of Charleston and studied medicine under his uncle, Dr. J. L. Dawson. Ancrum received his medical degree from the Medical College of the State of South Carolina in 1860 and was initially associated with the Shirras Dispensary in Charleston. Established in 1813, this small dispensary was one of several Charleston medical facilities commissioned by the city. The dispensary building pictured below was built in 1887 and was located on Society Street near Meeting. In later years it served as an ophthalmic dispensary, but among its noted physicians was Dr. Ancrum.

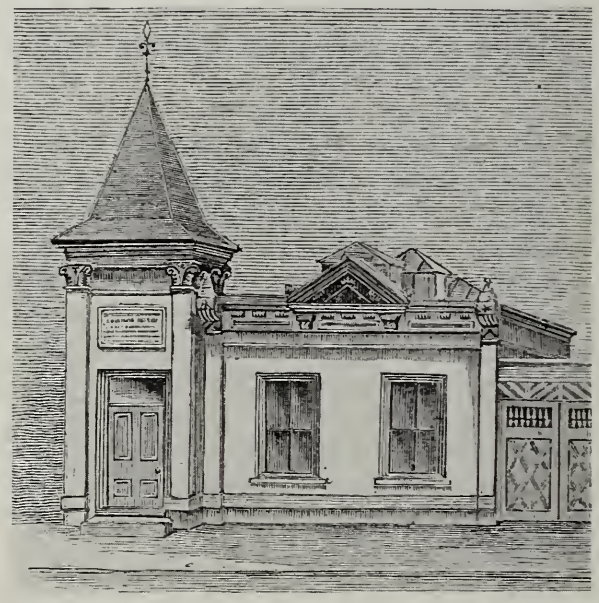
After graduating from the Medical College, Dr. Ancrum served as surgeon in the Confederate Navy on the "Nashville" and was apprehended by the Union forces when they overtook his ship in Bermuda as the vessel was preparing for a trip to England in its capacity as a blockade runner. After his capture and release by Federal officials, Ancrum was transferred to the Confederate Army and was to become a noted physician and administrator of Confederate Army hospitals in Tennessee. Following the Confederate War, Ancrum returned to South Carolina in Charleston where he served as surgeon to the local railroads and in the phosphate mining industry so important in South Carolina's post-reconstruction development.

Ancrum's tenure as President of the South Carolina Medical Association witnessed a time of notable changes in medicine in South Carolina. "Reconstruction" was essentially over. Communication through the telephone and automobile increased the efficiency and responsibilities of physicians. The increasing pace of newer methods of medical management and evolving pressures and responsibilities associated with the physician brought about many changes in which Ancrum gladly participated. As a physician he was assiduous and devoted to his patients and the opinions of his peers. He was said to have never sought political preference, but was constantly ready to give aid and counsel to those in need of welfare or community benevolence. One of his deepest affections was for the suffering of animals and he appalled the cruelty which he saw in his daily life toward nonhuman members of the animal world. It was with deep interest that he founded the Society for the Preservation of Cruelty to Animals and today, in Charleston, the society is named in his behalf.

Active in other areas of community life, Dr. Ancrum served as Secretary-Treasurer of the Board of Trustees for the Roper Hospital Fund and was an active member of the State Medical Association, contributing frequently to its *Transactions*.

Toward the latter years of his life, Dr. Ancrum's health failed and he reduced his level of medical practice. He travelled extensively at home and abroad seeking improvement in his health, but at last was compelled to remove himself from active medical practice and return to the community to Rossdhu near Abbeville where, on his old homestead, he finished the remaining years of this life interested in reconstructing the colonial architecture and landscape of his family home. It was here that Dr. Ancrum's full measure of generosity and hospitality was so widely felt as he contributed to the well-being of his neighborhood, community and friends. He died August 3, 1900.

— Thomas M. Leland, M.D., Ph.D.



SOUTH CAROLINA MEDICAL ASSOCIATION

AUXILIARY

REPORT OF THE PRESIDENT OF THE SCMA AUXILIARY TO THE 1986 SCMA HOUSE OF DELEGATES

The challenge of myriad change affecting the practice of medicine provided the impetus for Auxiliary action in 1985-86. Our goals have included working more closely with the South Carolina Medical Association, educating ourselves so that we might be more effective in our involvement, and maintaining our commitment to improving the quality of life in South Carolina through numerous health projects.

Convention '85 set the tone for the year. Communicating with South Carolina Institute for Medical Education and Research resulted in an agreement to match the Auxiliary's Scholarship Awards. Thus, it was possible to present eight scholarships to deserving students at the Medical University of South Carolina and the School of Medicine at the University of South Carolina. SCIMER and SCMAA will continue working together to provide scholarships.

Excitement filled the air during Spring Workshop in May. We were privileged to hear Dr. Kenneth Owens, Immediate Past President of SCMA, discuss medical society and Auxiliary relationships. Mr. William F. Mahon, Executive Vice President of SCMA, briefed us on the State Board of Medical Examiners crisis and discussed plans for the coming year. State officers and committee chairmen met with county counterparts for round table discussions and training. Following a brief Board Meeting, the four scholarship recipients from USC joined us for lunch.

In June, we watched with pride as Billie Brady graciously presided over the AMA Auxiliary convention in Chicago. South Carolinians serving as pages for the entire convention included Chairman, Mary Anne Douglas; Nellie Claire Brown; Elise Cain; Pat Duncan; Mary Ivester; Sara Shingler; and Saundra Smoak. During membership awards ceremonies our state was in the spotlight. Victorious in the membership challenge with Washington, Linda Smith and Susanne Black were proud recipients of a "salmon wind sock" and presented the losers with a "pecan tree." Sheila Davis presented South Carolina with plaques for the organization of Darlington and Marion Counties. At the conclusion of the House of Delegates, SCMA President, Dr. Leonard Douglas and I were privileged to present Billie with gifts from the Association, the Auxiliary and Greenville County, and gratefully welcome her back to South Carolina.

Once again, SCMAA joined the Department of Education and DHEC in sponsoring the State School Nurse Conference August 21, in Columbia. With assistance from Susan Brill and the Columbia Auxiliary, we registered participants. Your President addressed the group during lunch and received many expressions of appreciation for Auxiliary interest and participation. SCMAA is actively involved in communicating with state agencies and private groups interested in improving the quality of life. The South Carolina Child Protection Advisory Committee, chaired by Sarah Shingler, gives agencies providing child protection services an opportunity to meet and work together. Auxiliary members also served on various health care task forces appointed by the Governor.

Words cannot express the shock and grief felt by medical families throughout the state in September. Dr. Leonard W. Douglas was a man of deep integrity, who was devoted to his family, the welfare of the people of the state and the Association. He considered the Auxiliary to be a vital link between SCMA and the public. We have been inspired by his example to continue working toward the goals we shared.

South Carolina was well represented at AMA Auxiliary Confluence in Chicago in October. Susanne Black and I were accompanied by Donna Murphy, Auxiliary Staff Director, and officers from Colleton,

Florence, Horry, Lexington, Oconee, and York counties. Shelia Davis, of the AMAA Membership Committee, presented excellent ideas on recruiting and retaining members, and Billie Brady was most helpful to our entire delegation. Workshops and seminars covering a variety of topics provided excellent education and leadership training. State and county idea exchanges allowed us participants to learn from others and increased our awareness of the vital importance of the federation of county, state, and national auxiliaries.

Continuing our quest for knowledge, the Auxiliary was pleased to have Dr. Randolph Smoak, Chairman of SOCPAC and a member of the AMPAC Board, stress the importance of PAC membership at the Fall Board Meeting. Dr. Charles Duncan, Chairman of the SCMA Board of Trustees, discussed the proposed Tort Reform bill and asked for Auxiliary assistance. To prepare ourselves to render that assistance, Legislative Chairman, Carolyn Coker, planned a Legislation Information Day November 12, which was attended by more than 60 Auxilians. Dr. John Simmons, SCMA Secretary, explained alternative health care delivery systems which are developing in our state. Susie Nickles, Director of Health Policy Affairs, and William F. Mahon did an outstanding job of helping us understand the proposed legislation and the need for Auxiliary members to begin contacting members of the General Assembly. After listening to Senator John Courson's luncheon address, we all felt inspired to act.

County Auxiliaries are involved in a wide variety of health projects and contribute significantly to the health and well-being of the citizens of South Carolina, but we are not as effective as we should be in communicating that message to the public. Our Winter Board Meeting featured presentations by Billie Brady and Confluence speaker, Dave Partridge, on how to deal with the media effectively. Statewide Media Day on March 10 featured Auxiliary and Association participation in South Carolina Educational Television Network Telethon. With the help of Betty Macfie and Sarah Stephenson, a SCMAA Fact Sheet has been produced and distributed to the counties. Also at Winter Board, we were honored to hear SCMA President, Dr. Gavin Appleby, express his concerns, share his ideas, and give us an update on the Tort Reform legislation.

The Auxiliary's involvement and interest in the entire malpractice situation has intensified. Many Auxilians attended the Risk Management Seminar chaired by Dr. Euta Colvin and featuring Auxilian Margaret Ann Ashmore as luncheon speaker. Physicians and spouses, including two bus loads from Aiken, appeared en masse for the Senate Judiciary Committee public hearing on February 25. All who attended agreed that we must redouble our efforts if we are to be successful.

Membership has been an Auxiliary priority as we strive to improve upon last year's successes. Chairman, Pat Pulaski, spearheaded a membership blitz campaign in October and a membership awareness week in February. Her interest and enthusiasm will surely be reflected in our final tally.

AMA-ERF Chairman, Madge Littlejohn, has planned a unique statewide fund raiser. You are urged to "take a chance" on a week of free lodging at Hilton Head, Kiawah Island, or Beech Mountain. Winners will be announced at a drawing at convention. County Auxiliaries continue to support AMA-ERF. Although the holiday sharing card is a most dependable and popular method of contributing, other ideas include Anderson's Fashion Show, featuring original creations by Auxilians, and Oconee's auction. Lexington's first attempt to support AMA-ERF raised $900. Checks representing all Auxiliary contributions will be presented to the Deans of the state's medical schools at the SCMA House of Delegates.

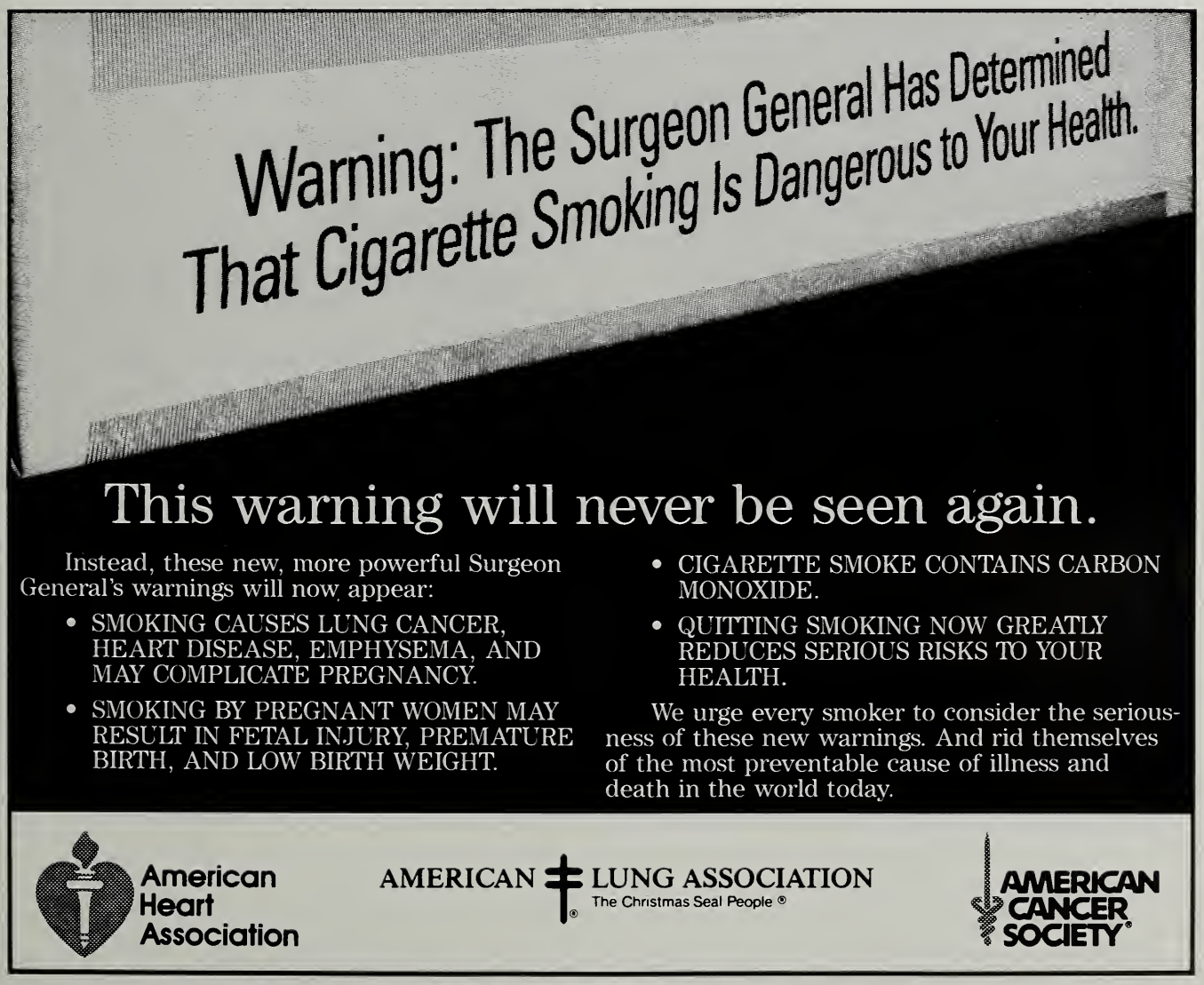
Health projects constitute a major Auxiliary emphasis. Chairman, Kathy Fisgus, distributed VHS tapes titled "Growing Up" to the regional vice presidents for use by all county Auxiliaries. These tapes address the problem of teenage pregnancy, as does Greenville's Council on Teenage Pregnancy and Spartanburg's Awareness Program. Anderson and Columbia have been active in raising funds and providing volunteers for the Anderson Area Health Care Clinic and the Columbia Free Clinic. Horry County is selling raffle tickets for a Caribbean cruise with profits earmarked for indigent health care in the community. Medical identification cards for diabetics have been provided by Beaufort County, while Florence has made caps for chemotherapy patients and Laurens has purchased prostheses for breast cancer patients. Sumter donated Anatomic Annie for the Red Cross CPR courses, and Charleston added to its educational museum program with "Mr. Bones on Bike" and raised funds for fetal development panels. Working with the fire department and the community, York County's "It's Alarming" program placed smoke detectors in the homes of elderly and handicapped citizens. Greenwood continues to provide various services to Senior

Citizens. All these activities demonstrate that physicians' families care about the people of South Carolina.

The assistance and advice of the South Carolina Medical Association has been essential to the accomplishment of Auxiliary goals. We are grateful for the efforts to keep Auxilians informed and involved. We appreciate the expertise provided by Staff Director, Donna Murphy, who has quickly become indispensable to the Auxiliary. Working together, the Association and the Auxiliary can and will face the challenges of today positively for the betterment of all we seek to serve.

Respectfully submitted,

Margaret C. (Skippy) Adkins,
(Mrs. Warrren Y.) President
South Carolina Medical
Association Auxiliary



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President's Page



A FOOT IN THE DOOR

Writing a President's Page is a challenging task which I will do the next twelve months. I hope in these pages to review and discuss with our members the SCMA's actions, postures, hopes and plans about a variety of topics. Including in these topics will be: (1) HMOs and alternative health payment plans; (2) relationship to ancillary health providers such as nurse practitioners, physicians' assistants, physical therapists, etc.; (3) relationship to non-MD "health professionals" such as psychologists, podiatrists, optometrists, etc.; (4) state and federal governmental programs — most notably DHEC — and our relationship to them; (5) our responsibility to the public with regard to fraudulent advertising and claims, to wit the chiropractors, "health food" dispensers, weight loss clinics, etc.; and (6) our relationship to our own Board of Medical Examiners and how we can help them and help ourselves as a profession in licensure and disciplinary activities.

This first President's Page will be devoted to report on our ongoing Tort Reform effort since it is the "hottest" of our current agenda items and the one in which I have been most involved.

On a scale of one to ten, I would estimate our success, so far, in the range of "three." Our original bill for which we had great hopes, has been, by any standard, emasculated by the Senate Judiciary Committee. All of our proposed reforms have been struck from the bill except the section which regards altering the statutes of limitations as it applies to minors. Even there, we have achieved less-than-asked-for changes. Caps on noneconomic damages, caps on lawyers' contingency fees, and the proposed change to allow disclosure of collateral sources of payment have been struck from our bill. We are left with a modified statute of limitations which will be thirteen years; admittedly this is an improvement over the current law which allows a "minor" to bring a tort action for as much as twenty-four years.

The balance of the Senate's altered bill contains several decidedly less important features:

First, the section regarding "nonmeritorious" or "frivolous" law suits, requiring the plaintiff to provide a "petition" to the court which includes a statement by a "similarly licensed" professional that the action does indeed have "merit."

Second, that punitive damage awards may not exceed "actual damages" awarded in actions, including actions involving death.

Third, restructuring certain parts of the physicians' liability insurance program currently in existence, the JUA.

How successful we will be, even with this poor excuse of a bill, only time will tell. We have at least three types of opposition. First, we have certain "activists" — most notably the trial lawyers — who proclaim we are trying to "destroy" the jury system and to destroy a tort system which has "worked well for two hundred years" in this state. This, of course, is not so. Second, we have a group who envision themselves "as protecting the consumer"; to this group we point out that it is always the consumer who ultimately pays for things like liability insurance. Third — and most dangerous — we have the members of the legislature who will work to delay actions on our bill. These are our most deadly opponents and the most effective antagonists to our efforts. Nonetheless, we are hopeful of having something in the way of a bill by the end of the current session.

Let me point out that the loss of our original proposals, which we know would have had most impact on the physicians' liability crisis, does not mean we have abandoned these goals; it does mean that we recognize that "half a loaf is better than none" right now. There remains a clear and continued commitment on the part of SCMA to seek truly "meaningful" tort reform. We have made this perfectly clear to the legislature, and to anyone else who asks — that we are *committed* to meaningful Tort Reform. Perhaps we will ultimately achieve this "coalition" with other professionals and other groups; certainly physicians can be proud that we have some measure of a "foot in the door" toward these clearly needed reforms.

Walter J. Roberts, Jr., M.D.
President

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THE JOURNAL
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A FIVE-YEAR STUDY OF INTESTINAL PARASITES IN CHARLESTON, SOUTH CAROLINA*

CAROLYN DOVER, B.S., M.T. (ASCP)
H. PRESTON HOLLEY, JR., M.D.
JUDY C. JARECKI-BLACK**
ERIC R. JAMES, Ph.D.

South Carolina has a subtropical climate where the temperatures are mild and the humidity is high, the moist soil providing an environment conducive to the survival and transmission of several parasitic organisms. Thus, a large number of parasitic diseases might be expected.[1]

Several investigators have assessed the prevalence of intestinal parasites and morbidity and mortality arising therefrom, providing definitive documentation that parasitic diseases are still prevalent in the United States,[2, 3] and specifically in South Carolina.[4, 5]

A retrospective five-year study was undertaken to assess the incidence of intestinal parasitic infections, the prevalence of pathogenic and nonpathogenic parasites and to evaluate findings based on age and sex in the population of patients seen at the Medical University of South Carolina (MUSC) hospital and associated clinics. Since some of the samples analyzed by the Parasitologic Laboratory were from a referred population the results of this study may not be applicable to the general population.

* From the Department of Laboratory Medicine and the Department of Medicine, Medical University of South Carolina, Charleston.
** Address correspondence to Ms. Jarecki-Black at the Department of Laboratory Medicine, Medical University of South Carolina, 171 Ashley Avenue, Charleston, S. C. 29425.

MATERIALS AND METHODS

During the five-year period from January 1980 through December 1984, 3,770 stools were examined microscopically for parasitic infection in the Parasitology Section of the Division of Clinical Microbiology in the Department of Laboratory Medicine. Specimens were received from the Medical University Hospital (MUH) and clinics and the Charleston Memorial Hospital (CMH). The patient population was comprised of persons from a variety of socioeconomic groups but many patients were from low-income families. Multiple negative and positive samples from the same individual were excluded in the analysis.

Each stool was examined first by a direct smear in saline and a second smear was examined from a concentrate of the stool prepared by the formalin-ethylacetate sedimentation technique.[6] The concentrate was stained with Dobell's iodine.[7] Polyvinyl alcohol (PVA), a fixative primarily for amebae and flagellated protozoa, was used to preserve all liquid stools. A fecal smear was made from each PVA fixed sample and a trichrome stain was performed.[8] In 1984, in addition to the above, each concentrate was examined for *Cryptosporidium* and stained by the modified cold Kinyoun stain to detect oocysts.[9] "Scotch tape" preparations were examined for all pinworm requests.[10]

Data from the Bureau of Laboratories of the State of South Carolina Department of Health and Environmental Control (SC DHEC) were obtained in order to compare the local findings at our hospital with those from across the State during the same period.

RESULTS

Table 1 lists the intestinal parasites found during this five-year period. Of 3,770 stools, 396 (10.5%) had evidence of one or more intestinal parasites. The most frequent pathogenic parasite was *Giardia lamblia*, which was seen in 4.4% of all examinations and accounted for 42% of all positive specimens. *Entamoeba histolytica* was present in 0.4% of all examinations and 3.7% of all positive stools exmained. *Entamoeba coli*, a non-pathogenic protozoan, was next in prevalence and accounted for 1.6% of all stools and 15% of all positive stools. *Blastocystis hominis* was the third most frequent enteric protozoan pathogen in the five years studied.

In 1984, *Cryptosporidium* was the most common parasite observed (Table 1), and was seen in 4.2% of all stools examined and 36% of all positive stools.

Of the helminth eggs, *Ascaris lumbricoides* was found in 1.5% of all stools examined and 13.8% of

TABLE 1. INTESTINAL PARASITES IDENTIFIED BETWEEN 1980-1984 AT MEDICAL UNIVERSITY OF SOUTH CAROLINA HOSPITAL

ETIOLOGICAL AGENT	1980	1981	1982	1983	1984	TOTAL	%
Intestinal Protozoa							
Giardia lamblia	43	52	32	21	18	166	4.4
Entamoeba coli	20	21	9	4	6	60	1.6
Endolimax nana	12	15	11	6	3	47	1.2
Cryptosporidium	-	-	-	-	25	25	.7
Blastocystis hominis	-	-	9	3	6	18	.5
Entamoeba histolytica	3	8	2	1	1	15	.4
Entamoeba hartmanni	3	6	4	1	-	14	.4
Dientameba fragilis	-	1	4	-	-	5	
Trichomonas hominis	1	-	1	2	-	4	
Iodoameba butschii	1	1	-	-	-	2	
Chilomastix mesnili	1	-	-	-	-	1	
Intestinal Helminths							
Ascaris lumbricoides	16	17	4	13	5	55	1.5
Trichuris trichiura	13	11	9	4	1	38	1
Enterobius vermicularis	2	2	6	5	2	17	.4
Hookworm	1	2	6	-	1	10	.3
Strongyloides stercoralis	2	2	1	1	-	6	
Trematodes							
Schistosoma mansoni	1	-	-	-	-	1	
Clonorchis sinesis	1	-	-	-	-	1	
Cestode							
Taenia sp.	1	-	1	-	-	1	
Total Parasites Found[1]	120	138	99	61	68	486	
Total Stools Positive for Parasites	99	104	80	53	60	396	
Total Specimens Examined	894	884	688	722	582	3770	
Percentage	11.1%	11.8%	11.6%	8.45%	10.3%	10.5%	

[1] Multiple parasites present in some specimens.
Multiple specimens from the same individual were eliminated.

all positive stools. *Trichuris trichiura* was the second most common helminth (1% of all stools examined and 11% of all positive stools).

Three helminth species were diagnosed on a single occasion only: *Schistosoma mansoni*, *Clonorchis sinensis* and *Taenia* sp., and these eggs were seen in specimens obtained from immigrants.

Table 2 shows the parasitic species identified in specimens submitted to the SC DHEC during the period of our study. The overall incidence of parasites found in South Carolina was 21% during the five-year period. Again, *Giardia lamblia* was the most common pathogen observed.

Table 3 shows the breakdown of cases based on age, race and sex during the years 1981 through 1984. Preschool children (less than five years of age) had the highest incidence of parasitic infections. As age increased there was a reduced number of parasitic infections found, but all age groups were affected. There was no difference found in the incidence of parasitic infection between sexes.

During the years 1981 through 1984, 45 individuals had two parasites identified in the stool concurrently, and 13 individuals had three or more parasites.

TABLE 2. TOTAL PARASITES IDENTIFIED DURING 1980 - 1984
AT SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

ETIOLOGICAL AGENT	1980-81	1981-82	1982-83	1983-84	TOTAL
Protozoa					
Entamoeba coli	359	361	392	306	1418
Giardia lamblia	417	261	287	271	1236
Endolimax nana	243	209	240	223	915
Entamoeba hartmanni	114	137	175	121	547
Entamoeba histolytica	64	98	105	58	325
Trichomonas hominis	-	67	152	28	247
Iodoameba butschii	17	19	37	34	107
Chilomastix mesnili	14	6	45	36	101
Intestinal Helminths					
Ascaris lumbricoides	183	156	116	62	517
Trichuris trichiura	79	71	32	18	200
Hookworm	28	40	7	3	78
Strongyloides stercoralis	16	13	6	5	40
Enterobius vermicularis	10	5	8	5	28
Trematodes					
Clonorchis sinesis	12	7	5	6	30
Schistosoma mekongi		1			1
Paragonimus westermani		1			1
Faciola sp.		1			1
Cestode					
Hymenolepsis nana	11	9		2	22
Taenia species	2	2		5	9
Hymenolepia diminuta			1		1
Dipylidium caninum			1		1
Total Parasites Found	1569	1464	1609	1183	5825
Total Specimens Examined	8218	6924	6528	6150	27820
Percent positive	19%	21%	24.6%	19%	20.93%

TABLE 3. REPORTED INCIDENCE OF INTESTINAL PARASITES BY AGE, RACE AND SEX AT MUSC FOR 1981-1984

RACE / SEX	1981								1982								1983								1984								GT
	BM	BF	WM	WF	OM	OF	NK	T	BM	BF	WM	WF	OM	OF	NK	T	BM	BF	WM	WF	OM	OF	NK	T	BM	BF	WM	WF	OM	OF	NK	T	
AGE																																	
0-5	9	7	10	7	-	-	3	36	5	11	1	5	2	-	2	26	4	2	2	2	-	-	-	10	5	3	3	7	-	2	3	23	95
6-15	12	10	2	5	2	1	1	33	4	7	3	2	-	-	2	18	2	-	1	3	-	-	1	7	-	2	1	1	-	-	-	4	62
16-25	2	5	1	4	-	-	2	16	3	1	4	3	2	-	-	13	-	4	-	3	-	-	-	7	2	-	2	1	-	-	1	6	42
26-35	-	-	1	2	1	1	1	6	2	4	1	-	3	2	3	15	2	1	4	2	-	-	1	10	2	1	5	2	-	1	1	12	43
36-45	-	-	7	4	-	-	-	11	1	1	-	3	-	1	-	6	2	-	1	1	-	-	1	5	-	-	1	-	-	-	1	2	24
46-55	-	-	-	-	-	1	-	1	-	-	1	1	-	1	-	3	-	-	1	2	-	-	-	3	-	-	1	1	-	-	1	3	10
56-65	-	2	1	-	-	-	-	3	1	3	1	-	-	-	-	4	-	-	1	1	-	-	-	2	-	1	-	-	-	-	-	1	10
65	2	-	-	-	-	-	-	2	1	3	1	-	-	-	-	5	-	-	2	2	-	-	-	4	-	3	-	-	-	-	-	3	14
TOTAL	25	24	22	24	3	3	7	108	17	30	11	14	7	4	7	90	10	7	12	16	-	-	3	48	9	10	13	12	-	3	7	54	300
Total Individuals								71								71								38								44	

Key: M = male, F = female, B = black; W = white, O = other, NK = not known; T = total, GT = grand total

DISCUSSION

Protozoans were the most common cause of intestinal parasitic infections identified during a five-year survey both at MUSC and SC DHEC Bureau of Laboratories. In both surveys, *Giardia lamblia* was found most frequently; however, *Entamoeba histolytica* is probably the most serious parasitic infection in this country. The prevalence of *E. histolytica* seems to be declining at our Medical Center (Table 1).

Prior to August 1981, only a few cases of *Cryptosporidium* were found in humans and these cases were mostly diagnosed by intestinal biopsies. Before December 1983, no requests for *Cryptosporidium* were made at MUH because we were unaware of the significance of this pathogen in humans. After learning to recognize cryptosporidial oocysts by stool examination and the proper staining techniques, we began to routinely look for these organisms in all stools. In 1984, *Cryptosporidium* was the most common intestinal pathogen found at MUSC.[11] There were no cases of *Cryptosporidium* reported in FY 1983-84 by the SC DHEC Laboratory.

Blastocystis hominis was not listed as a pathogen in SC DHEC data. Early parasitologists classified *B. hominis* as a Schizasaccharophyllous yeast and considered it harmless and easily confused with *Entamoeba histolytica.*[12] Later, evidence indicated that *B. hominis* was not a yeast and it has since been reclassified as a protozoan.[13] It appears to be even more common in lower primates than in humans.[14] When present in large numbers in the absence of bacterial and viral agents, parasitologists in many diagnostic laboratories recognize *B. hominis* as a cause of diarrhea and recommend treatment.[12, 15]

Before 1982, *B. hominis* was not reported when seen on stool examination in our laboratory because it was considered to be nonpathogenic. During the five-year study at MUSC, *B. hominis* was the third most frequently identified pathogenic parasite despite the absence of data from 1980-1982.

Ascaris lumbricoides and *Trichuris trichiura* were the helminths most commonly detected in both laboratories. Earlier studies have shown widespread intestinal helminthic infection in South Carolina.[4, 5, 16] In 1978, the Centers for Disease Control (CDC) initiated a quarterly survey to determine the frequency of intestinal parasitic infections by state and territorial public health laboratories. In their survey, *Trichuris trichiura* was the most commonly identified helminthic parasite (1.8%) and *Ascaris lumbricoides* was second (1.5%).

Enterobius vermicularis (pinworm) is considered to be the most common pathogenic parasite in the United States. Its low frequency in both surveys reflects the low sensitivity of stool examinations in the diagnosis of infections versus "scotch tape" preparations.[1]

A total of 66 trematodes and cestodes were reported in the SC DHEC study and only three from these groups were found in the Medical University's data. Trematode and cestode infections seem to be uncommon in Charleston.

Further analysis of cases by age group showed that children under age five had the highest incidence of infection (Table 3). This finding suggests that intestinal parasites continue to be common among young children in our area. Other investigators have also suggested that the prevalence of parasitic infections is high among young children despite advancements in sanitation and personal hygiene and that this problem is not restricted to any socioeconomic segment of the population.[17]

Several factors suggest that the true incidence of intestinal parasites in the general population of coastal South Carolina is considerably higher than our study revealed. First, specimens were obtained from a relatively select population., i.e. persons who visit physicians. The availability of over-the-counter antihelminthic drugs and the tendency of some persons to treat themselves or their children without diagnosis is well known in our area. Second, the Medical University Hospital Parasitology Laboratory is one of several laboratories in the Charleston, South Carolina area. Findings may be higher in other laboratories, particularly where low-income families may represent a higher proportion of patients. Third, clinical diagnosis and treatment of patients by physicians without laboratory verification of infection may be a factor. This factor may explain the relative infrequent finding of pinworms. Fourth, in many instances multiple stool samples were not submitted. It has been noted,[10] particularly in protozoan infections, that positive findings increase with the number of specimens examined from an individual. Although this point is emphasized to clinicians and medical students, multiple specimens are not always submitted on each individual patient. Fifth, the fact that many intestinal parasitic infections are asymptomatic also results in underreporting of these parasites.

In both laboratories, parasitic identification rates did not significantly change during the study period. The variation in the percentage of positive stools in the Medical University's data (1983, 8.5% and 1984, 10.3%) probably represents year-to-year variations rather than a significant change in frequency of infection. It is clear that intestinal parasitic infections remain a serious problem in South Carolina despite effective forms of therapy for most intestinal parasites. The apparent reasons for the persistent problem include an environment conducive to parasitic infection and a large portion of the study population living under poor socioeconomic conditions. Physicians throughout South Carolina should remain aware of the problem of intestinal parasites and attempt to diagnose such infections when symptoms or signs of intestinal disease are present or the peripheral blood reveals eosinophilia.

SUMMARY

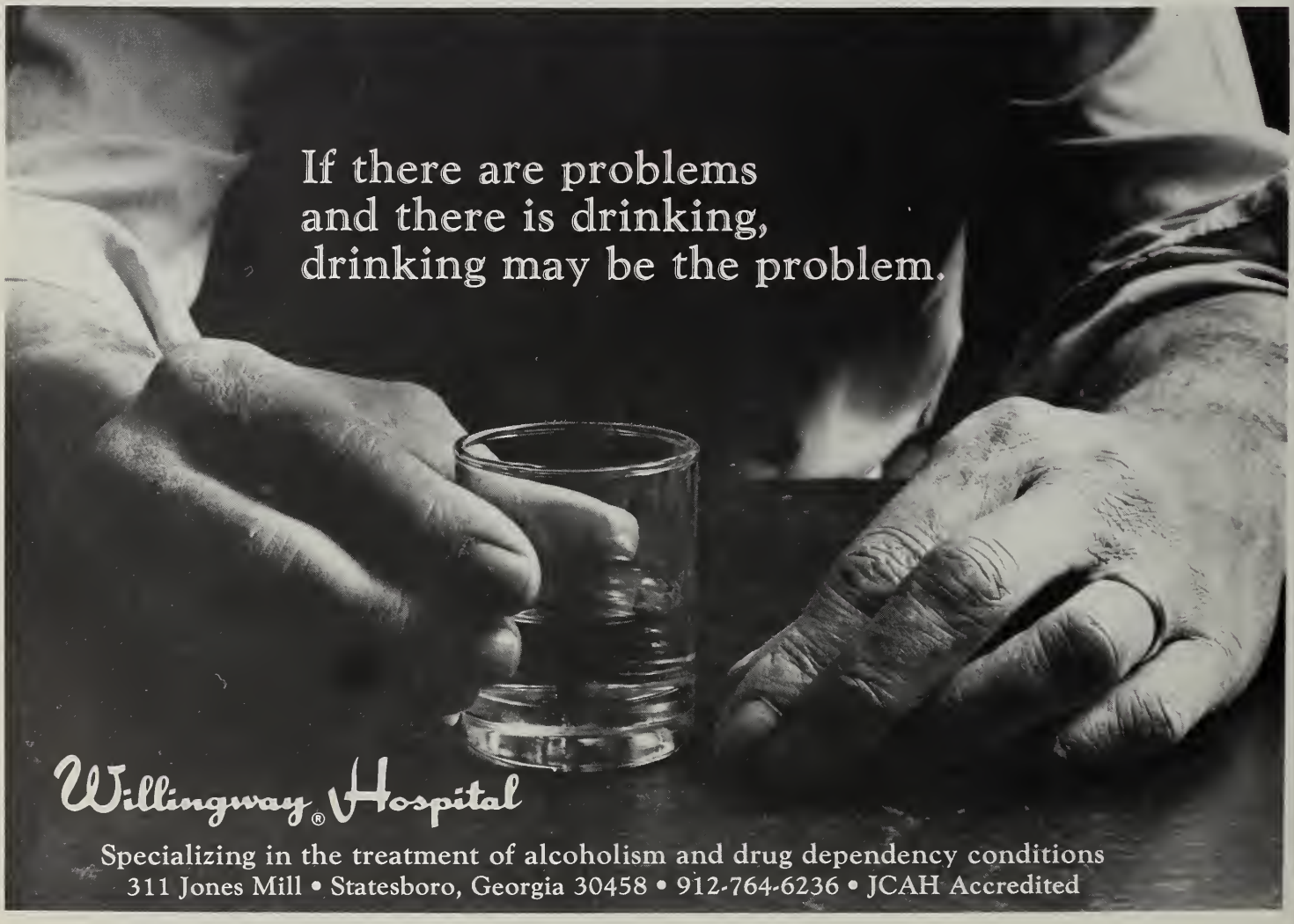
A five-year survey of 3,770 stools at the MUSC Parasitology Laboratory showed the prevalence of parasites to be 10.5%. On a much larger number of specimens, the SC DHEC had an average incidence of 21% during the same period, 1980 through 1984. In both surveys, *Giardia lamblia* was the most common pathogenic parasite seen until 1984 and in 1984 *Cryptosporidium* was most commonly seen at the Medical University Hospital Laboratory. Since *Cryptosporidium* has not been specifically looked for in previous years, it is likely that it had been overlooked before 1984. Intestinal protozoa were the most common parasites identified and *Cryptosporidium* seemed to be emerging as a common intestinal parasite, based on data from 1984. Intestinal parasites remain a common problem in our patient population in Charleston, as well as in South Carolina as a whole.

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CARCINOMA OF THE LUNG: ONE HUNDRED CONSECUTIVE CASES*

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Carcinoma of the lung remains a most lethal disease and will account for approximately 120,000 deaths in the United States this year. From statistics published by the American Cancer Society in January, 1985, it is estimated that there will be 1,800 new cases of carcinoma of the lung in South Carolina this year. Those cases that are diagnosed early, before clinical evidence of spread from the primary site, have a moderately favorable prognosis. Once metastases or extension to surrounding structures have occurred, the probability of cure is poor. With the development of TNM classification, discussed below, prognosis for different stages and subgroups can be approximated with the initial evaluation.

A review of 100 consecutive cases of carcinoma of the lung, evaluated and treated by the authors, allowed a realistic appraisal of this disease. These 100 cases were seen in a period of one and one-half years. The study has aided in the development of criteria for treatment and prognosis. The number of diagnostic thoracotomies has been reduced and the resectability rate has increased. Initial clinical evaluation has improved considerably during the past decade.

Essentially, carcinoma of the lung is of four major cell types. These are *squamous cell carcinoma*, *adenocarcinoma* (including bronchoalveolar carcinoma), *small cell carcinoma*, and *large cell carcinoma*. Some neoplasms show a mixture of cell types but usually one cell type is dominant. Squamous cell carcinoma remains the most common in most institutions. In our series, 38 patients had squamous cell carcinoma. In general, this type originates in the proximal portions of the tracheobronchial tree and tends to spread by regional lymphatics. On chest roentgenograms, the carcinoma often appears as a hilar or perihilar density. Obstructive pneumonia and atelectasis are not uncommon.

Adenocarcinoma accounted for 23 of the 100 cases. These usually develop in a secondary bronchus or in the parenchyma and are demonstrated radiographically as peripheral tumors. This type can appear in areas of pervious scarring or as the cause of pleural effusions associated with pleural implants.

Next in order of frequency were the small cell (oat cell) carcinomas which accounted for 27 percent. This type has one of the strongest relationships to cigarette smoking and is unusual in the non-smoker or in someone who has quit smoking for ten years. Most are of the central or hilar type. Because of its tendency to metastasize widely and early, the small cell carcinoma has the worst prognosis. This cell type is most often associated with ectopic hormone production and with central nervous system metastases.

Eighteen of our patients had large cell carcinoma. This type usually appears as a large peripheral mass, most exceeding four centimeters in diameter when found. It is not unusual for it to invade the chest wall.

Although many reports show a great increase in carcinoma of the lung in women, in our series there were 68 male and 32 female patients. The youngest patient was 38 years of age and the oldest was 89 years of age. Eighty-four patients were equally distributed in the three decades between 50 and 80 years. Ten patients were 80 years and older.

CLASSIFICATION

The currently accepted system for the staging of lung cancer is the TNM classification developed by the Task Force on Lung of the American Joint Committee for Cancer Staging and End-Results Reporting.[1] This classification describes the extent of the disease by codes, T, N, and M with appropriate suffixes. T denotes the extent of the primary tumor, N nodal involvement, and M

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the distant metastases. The TNM groupings are placed in stages I, II and III. Classifying tumors by this standard provides consistency in communications regarding lung cancer patients, helps to determine prognosis, and is meaningful regarding treatment regimens. Withoug going into detail, the system works in this way. A T1 tumor would be less than three centimeters in diameter and a T2 tumor would be greater than three centimeters in diameter. N1 would refer to hilar node metastases and N2 would denote mediastinal node involvement. MO would indicate that there were no distant metastases and M-brain would signify brain metastases. Therefore, a T1 NO MO tumor would be small with no node involvement nor any distant metastases and would be placed in stage I which carries a favorable prognosis when resected. On the contrary, T2 N2 M-brain would classify a large tumor with mediastinal node and brain metastases. It would be a stage III tumor with a very poor prognosis.

Only 35 of the tumors in our consecutive series were in stage I. Thirty-three of these had no positive lymph nodes at operation whereas two had positive hilar nodes. Only 35 of the 100 patients could be given a favorable prognosis. Five year survival rates for the remaining 65 patients would be reduced considerably.

DIAGNOSTIC PROCEDURES

Newer diagnostic procedures and more specific use of some of the older ones have brought about a much more accurate appraisal of carcinoma of the lung. The accuracy of clinical staging has obviated the diagnostic thoracotomy in many instances and has resulted in a much higher resectability rate in those patients subjected to thoracotomy.

In the approach to a patient suspected of having carcinoma of the lung, a practical program of diagnosis must be followed so as to keep invasive procedures to a minimum and to maintain cost effectiveness. When an adult is seen with a single small peripheral non-calcified density in the lung, very few diagnostic procedures are done prior to thoracotomy. The chance of establishing a diagnosis with sputum examination, bronchoscopy, scalene node biopsy and computed tomography of the chest is remote. A *negative* needle biopsy is usually unacceptable. A bronchoscopy would be combined with thoracotomy merely to rule out an additional endobronchial tumor. For hilar lesions and parenchymal lesions somewhat more advanced, bronchoscopy and cervical node biopsy would be done if it were thought that specimens could be obtained by bronchoscopy and if there was a reasonable chance that cervical nodes might be positive. Several of the diagnostic procedures warrant discussion.

Computed Tomography

Because of the grim outlook associated with carcinoma of the lung and mediastinal involvement, evaluation of the mediastinum is essential in the pretreatment phase if mediastinal involvement is suspected. Computed tomography (CT) scan in experienced hands is highly accurate. Breyer and associates [2] found an accuracy of 93 percent in a study of 46 patients subjected to CT scan preoperatively. Rea and associates[3] found the CT scan to be of sufficient accuracy to conclude that a negative study obviates the necessity of mediastinal sampling of nodes to determine operability. Modini and associates[4] evaluated the use of the CT scan of the chest, brain and upper abdomen for clinical staging of 113 consecutive patients with histologically confirmed carcinoma of the lung. Comparisons with mediastinoscopy and surgical findings were made regarding the extent of primary tumor in 47 patients and nodal involvement in 41 patients. The CT scan was accurate 82.9 percent for mediastinal node involvement. Thirty-two of the 85 patients studied by total CT scan had distant metastases, of which 24 (75 percent) were clinically silent.

In our own practice, we have found the CT scan of the chest valuable for clinical staging of lung cancer. Mediastinal involvement is usually a contraindication for thoracotomy.

Needle Biopsy of the Lung

Needle biopsy of the lung is used selectively. It has become much safer and infinitely accurate when done with a fine needle placed by computed tomography or fluoroscopy. We use this procedure mainly to establish a histological diagnosis for patients who are poor candidates for operative therapy. For those patients who are borderline surgery candidates, but whose tumor is favorable for cure if resection can be accomplished, establishment of a diagnosis of carcinoma by needle biopsy sometimes tips the scales toward resection.

Flexible Bronchoscopy

Flexible bronchoscopy is helpful to invade the

segmental bronchi. With the aid of fluoroscopy, the flexible scope can be positioned so that a brush or biopsy instrument can be extended from it to acquire biopsy or cytological specimens in the small distal bronchi that cannot be approached with the conventional rigid bronchoscopy.

Cervical (Scalene) Node Biopsy

Positive cervical nodes are usually a contraindication to resection. Enlarged cervical nodes is a clear indication for biopsy when visceral carcinoma is suspected. The role of biopsy when nodes are not palpable remains unclear. Schatzlein and associates[5] biopsied nonpalpable cervical nodes in 101 consecutive patients. Only 8.9 percent were positive for metastatic disease. No patient with a peripheral primary lesion, regardless of size or cell type, had metastases to the cervical nodes. Six of 15 patients with centrally located adenocarcinomas had scalene node metastases, while only one of 40 patients with central squamous cell carcinoma had a positive scalene node biopsy. Brantigan and associates[6] found a higher incidence of positive nodes (23.8 percent) when bilateral biopsies were done on patients without palpable cervical nodes. Lawton and Brintnall[7] analyzed 566 cases of scalene node biopsy and found the yield of positive information in the absence of palpable nodes despairingly meager. Our own indications for cervical node biopsy are the presence of palpable nodes, a suspicion of mediastinal involvement, central lesions, and for patients who present with a poor risk for thoracotomy, but for whom a diagnosis is important so that adjuvant therapy can be considered.

Mediastinoscopy, Mediastinotomy

The sampling of mediastinal lymph nodes by either mediastinoscopy or mediastinotomy is important for staging. Although there are occasional reports of five year survivors with positive mediastinal nodes, in general this finding should discourage operative treatment. Ashraf, Milsom, and Walesby[8] carried out mediastinoscopy as a routine procedure in 874 patients. Two hundred and thirty-six (236) patients (27 percent) were found to have involved mediastinal nodes.

We select patients for mediastinal node sampling on the following basis:

(1) Radiographic evidence of mediastinal involvement.
(2) Central lesions in which margins for resection are in doubt.
(3) Poor risk patients in whom one wishes to avoid thoracotomy unless all evidence indicates a satisfactory chance for a curative resection.
(4) When a diagnosis of carcinoma is required for proper treatment and not available by lesser procedures.

We usually do not perform this procedure for peripheral tumors with no radiographic evidence of mediastinal metastases. We prefer sampling the mediastinum through a short second or third intercostal space just lateral to the sternum. The procedure gives excellent exposure and control of bleeding.

TREATMENT

In localized carcinoma, especially in non-small cell carcinomas of the lung, resection is the treatment of choice when other health conditions are not a contraindication. When there is residual tumor, either local or distant, other forms of therapy are needed. If the remaining disease is local, in the form of involved hilar or mediastinal lymph nodes following surgical resection, adjunctive x-ray therapy and occasionally chemotherapy, or their combination is indicated. In small cell carcinoma, frequently chemotherapy is given alone or prior to x-ray therapy.

In our series 26 patients had resection only, and 18 had resection followed by adjuvant therapy (radiation, chemotherapy). Fifty patients received adjuvant therapy only and six patients received no treatment because of their poor condition. Of the 44 patients who had resection, 35 were in stage I and nine were in stage II. Of the 35 stage I patients, two had positive hilar nodes. Pathological distribution of the 44 patients who had resections were 20 patients with squamous cell carcinoma, and three with small cell carcinoma. Approximately two-thirds of our patients were candidates for either radiation therapy, chemotherapy or their combination.

Preoperative x-ray therapy was reserved for those patients with superior sulcus tumors who usually had the diagnosis proven prior to treatment by needle biopsy. The rationale for preoperative x-ray therapy is as follows:

(1) To reduce the high incidence of local spread of disease and to increase the resectability rate.

(2) To decrease the spread of the disease to regional lymph nodes.
(3) To decrease the possibility of tumor spread during the resection.
(4) To decrease the incidence of postoperative recurrence.

Postoperative x-ray therapy was the treatment of choice in patients with local residual tumors of the non-small cell type. It was also the treatment of choice in patients with unresectable lesions which were obstructing, bleeding, or had a high probability of either or both of these conditions. When x-ray therapy is the only form of treatment in such cases, the five year survival is in the range of five to 10 percent. When x-ray therapy is used in conjunction with surgery for positive mediastinal nodes, the survival rate is somewhat improved. According to Martini and associates[9] the survival rate increases to as high as 48 percent for five years for patients with non-small cell carcinomas classified as T1 N1 MO, who have undergone resection and who receive additional therapy. X-ray therapy is also indicated in patients with chest wall invasion and is particularly effective for the relief of metastatic bone pain, superior vena caval compression, and for symptomatic brain metastases. The use of prophylactic whole brain radiation has been well accepted for patients with small cell carcinoma.

The specialty of chemotherapy is presently experiencing an increase in interest and patient survival with the advent of new drugs and improved protocols. In numerous centers, small cell carcinoma is no longer considered a surgical lesion. The survival of individuals with small cell carcinoma, with present drug protocols, has increased from a few months to an average of one to two years. Occasionally, a cure has been accomplished with chemotherapy but this continues to remain a disappointingly low percent of the overall patient grouping.

The rationale against resectional therapy for small cell carcinoma is supported by the high incidence of early metastasis and rapidly progressing disease. In our opinion, stage I small cell carcinoma should be resected but followed with appropriate systemic chemotherapy. This opinion is supported by a report from the Veterans Administration Surgical Oncology Group (VASOG) in which the overall 23 percent five year survival was attained in a group of 132 patients who had resections for small cell carcinoma. In the T1 NO MO group, the five year survival rate was 59.5 percent.[10]

The treatment of non-small cell carcinomas is markedly on the rise with the advent of newer drugs and improved protocols. There are now reports of responses of squamous cell carcinoma to different drug protocols.

At the present time, we feel that in our practice all surgical lesions which can be safely removed should be excised and localized disease treated appropriately. □

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SURGICAL TREATMENT OF RENAL CELL CARCINOMA EXTENDING AS A TUMOR THROMBUS INTO THE SUPERIOR VENA CAVA: A CASE REPORT*

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Malignant renal tumors, in particular renal cell carcinoma, have a demonstrated tendency in five to ten percent of cases to extend as a thrombus into the vena cava, gradually propagating toward the atrium and the right side of the heart.[1, 2] By far the majority of reported cases originate from the right kidney.[3] The tumor may grow through the tricuspid valve and into the pulmonary circulation.[4] Additionally, the risk of the venous thrombus breaking up and becoming a major embolus exists. Therefore, in the treatment of renal malignancies, diagnostic evaluation of possible venous extension should be undertaken, since the therapeutic nephrectomy would need to be supplemented by caval atrial thrombectomy or even pulmonary thrombo-embolectomy.

This case report and a review of the literature serve to highlight some of the diagnostic considerations as well as the available surgical armamentarium necessary to complete the surgical extirpation of a renal cell carcinoma complicated by a tumor thrombus extending into the vena cava.

CASE REPORT

This 76-year-old-male patient presented with hematuria and weight loss. Urography revealed a right renal carcinoma. A vena cava contrast study suggested tumor thrombus extending into the inferior vena cava to the level of the atrium. Metastatic evaluation revealed no secondary lesions.

In preparation for ablative surgery, the patient first underwent right renal artery embolization as these tumors have a propensity to be highly vascular. Later, under general endotracheal anesthesia and hemodynamic monitoring, a surgical incision was carried out from the manubrial notch to the symphysis pubis. The duodenum and right colon were mobilized medially for access to the renal mass and the vena cava. Vessel loops and tapes were placed for appropriate vascular control. In the mediastinum, the pericardium was incised and purse string sutures were placed at the aorta and at the right atrial appendage, should extracorporeal bypass become necessary.

An incision was made in the right atrial appendage and a finger placed through the purse string to localize the caval-atrial junction and guard against thrombus dislodgement. A radical right nephrectomy was performed. Subsequently, a longitudinal cavotomy was done, the thrombus was peeled from the caval walls, keeping the assistant's finger in the right atrium, and a Foley catheter with a large balloon was passed antegrade to the atrium and then retracted caudad, thus extruding the tumor thrombus through the cavotomy. The substantial amount of blood disgorged through this maneuver was halted by tethering the previously placed loops and tapes and the spilled blood was collected in an autotransfusion system. This system is standardized, provides its own heparin for the collection line, and is completely sterile. The blood is returned to the patient electively after it is washed and centrifuged in a Haemonetics Cell Saver.° The cav-

° From Roper Hospital, 316 Calhoun Street, Charleston, S. C. 29401.
°° Address correspondence to Dr. Voegele at Ashley House, Lockwood Blvd., Charleston, S. C. 29401.

° Haemonetics Corp, Natuk, MA.

otomy incision was closed over a partially occluding clamp utilizing fine cardiovascular polypropelene suture, and the atrial purse string was closed. The renal fossa was drained with a suction drain, and the surgical incision closed in layers. The patient made a satisfactory recovery and remained essentially asymptomatic on a chemotherapy regimen. At the time of his death nine months following operation, there was evidence of metastatic disease.

DISCUSSION

This case and others in the literature serve to demonstrate the insidious nature of this disease. The protean manifestations of cavo-atrial involvement even when the renal tumor itself is asymptomatic, is probably due to the presence of early and rich collateralization and a large venous channel able to compensate for the relative obstruction.[5] Ascites and edema are rare. Urography and vena cavography represent the most useful tools for the delineation of the tumor and its protruding thrombus. Not utilized in this instance, but of significant value, could be the echocardiographic examination of the right heart chambers and valvular orifices. In addition, CAT scan evaluation of the abdomen is helpful in demonstrating lymph node enlargement, invasion of next lying structures, and serves to demonstrate the presence and extent of the intracaval tumor thrombus.

The tumor thrombus protudes into the lumen of the vena cava rather than invades it. Nevertheless, the neoplastic thrombus can continue to grow and may come to occupy the right ventricle or pulmonary artery. Fragmentation of the mass and subsequent metastatic embolism further magnify the threat from this condition. Conversely, tumor thrombectomy has been associated with a low operative mortality and 70 percent of patients treated surgically survive an average of 12 months.[2, 3]

Technical considerations have centered on approach and exposure as well as vascular control and protection from embolic fragmentation. Although a multitude of approaches have been described, there is fair agreement that the best approach is through a combined median sternotomy and midline laparotomy, in that it offers rapid and unencumbered access to mediastinal structures for possible use of cardiopulmonary bypass and simultaneously allows an approach to the suprarenal and infrarenal vascular structures. Furthermore, median sternotomy gives access to the atrium, the atrial-inferior vena cava junction and offers possible internal control of that anatomic landmark by placing an assistant's finger through a purse string suture at the atrial appendage as demonstrated in Figure 1. Through the median sternotomy, one may avoid entering the pleural cavities or one may deliberately explore the lungs for possible concomitant excision of metastases. Extracorporeal circulation is seldom necessary except where access to the right heart cavities or outflow tract are contemplated. Preoperative tumor embolization is helpful as these tumors are highly vascular neoplasms. Blood shed at the time of thrombus extraction from the vena cava can be retrieved with an autotransfusion system which allows simultaneous heparinization of the collected blood. This then can be returned immediately should the patient's condition warrant it, or preferably the red cells can be washed and centrifuged with a cell saver apparatus and then returned to the patient electively.



FIGURE 1. Operative view and technique of caval thrombectomy in case of renal cell carcinoma and caval tumor thrombus.

In conclusion, we can state that patients with renal malignancies who are further threatened by potential intracaval tumor thrombus can be helped by surgical intervention with a low mortality and offered a reasonable chance of prolonged survival. Such surgery should be performed where extracorporeal circulation is available on a routine basis. A suitable technical approach includes median sternotomy and midline laparotomy, preparation for possible cardiopulmonary bypass, internal control of the distal thrombus, and retrieval of the tumor thrombus subsequent to radical nephrectomy utilizing an autotransfusion system for collection of shed blood.

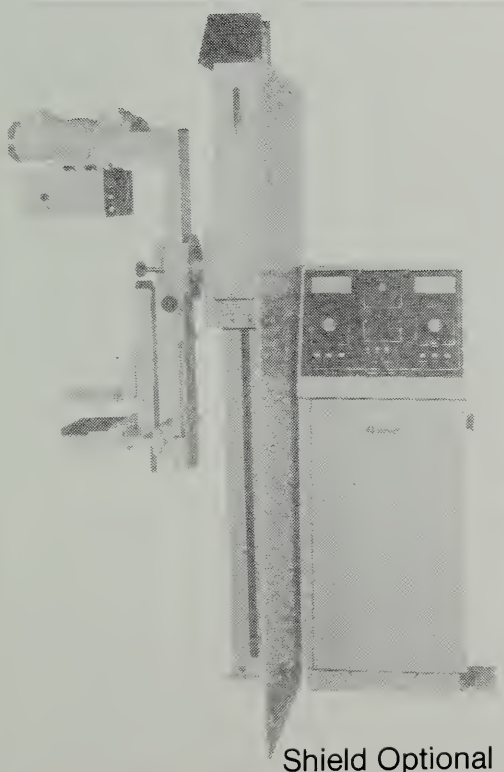
SUMMARY

The successful surgical management of a large intracaval tumor thrombus arising from a renal cell carcinoma is described. This case prompted us to record our experience with specific reference to diagnostic methodology and surgical technique including the use of autotransfusion. □

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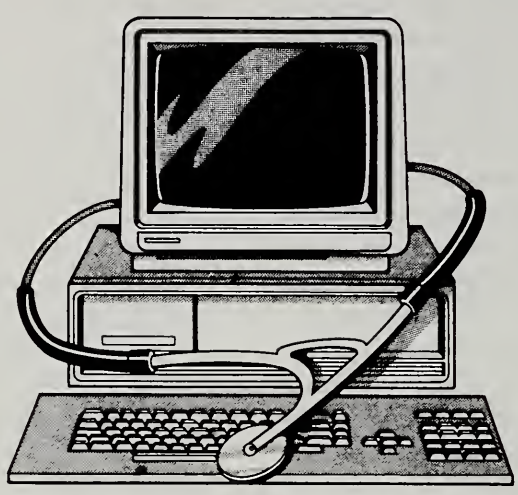
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SCMA NEWSLETTER

May, 1986

138TH ANNUAL SCMA MEETING

CHARLESTON, SOUTH CAROLINA

April 23 - 27, 1986

A total of 547 physicians registered during the 138th Annual Meeting of the SCMA. Exhibitors, guests and staff attending, when included, swell that figure to what is believed to be a record "high."

Attendance in the House of Delegates was considered excellent also, with 146 Delegates checked in at the Credentials Desk on Thursday morning, April 24, and 162 Delegates checked in Sunday for the closing session.

ELECTIONS

The election procedure for new Officers, Trustees, and Delegates and Alternates to the American Medical Association followed that established last year, with nominations being made on Thursday, and voting for any contested positions taking place by ballot on Sunday. Following is a summary of those elections:

President-Elect: *Charles R. Duncan, Jr., M. D.*, an ophthalmologist in private practice in Greenville. Dr. Duncan has served as Trustee from the Fourth Medical District, as Chairman of the Board of Trustees, and as AMA Alternate Delegate. He is also serving as the current President of the S. C. Society of Ophthalmology.

Secretary: *John W. Simmons, M. D.*, was re-elected for a second term as SCMA Secretary. Dr. Simmons is a Family Practitioner from Spartanburg.

Treasurer: *Thomas C. Rowland, Jr., M. D.*, nominated by the SCMA Board of Trustees, will be serving his third term as Treasurer. Dr. Rowland is an OB/GYN in private practice in Columbia.

Trustees: *Edward W. Catalano, M. D., Columbia, District 2*
Frank W. Young, M. D., West Columbia, District 2

James B. Page, M. D., Greenville, District 4
William J. Goudelock, M. D., Easley, District 4 (re-elected)

James M. Lindsey, Jr., M. D., Conway, District 6

John W. Rheney, M. D., Orangeburg, District 8 (re-elected)

ELECTIONS (continued)

AMA Delegates:	*John C. Hawk, Jr., M. D.* (Term: 1/1/87-12/31/88) *Randolph D. Smoak, Jr., M. D.* (Term: 1/1/87-12/31/88)
AMA Alternate Delegates:	*Charles R. Duncan, Jr., M. D.* (Term: 1/1/87-12/31/88) *J. Gavin Appleby, M. D.* (Term: 1/1/87-12/31/87) *Kenneth N. Owens, M. D.* (Term: 1/1/87-1/31/88)
Speaker of the House:	*Benjamin E. Nicholson, M. D., Edgefield*

BOARD OF TRUSTEES ELECTIONS

Following *sine die* adjournment of the House of Delegates on Sunday, the new Board of Trustees met for the purpose of reorganization. The elections which were held resulted in the following:

Chairman of the Board:	*Daniel W. Brake, M. D.* Dr. Brake is a Family Practice physician from Charleston. He has served as Trustee from the First District since 1985 and has been the At Large Member of the SCMA Executive Committee. Dr. Brake is the immediate Past President of the S. C. Academy of Family Physicians.
Vice Chairman:	*John W. Rheney, M. D.* Dr. Rheney is a Pediatrician from Orangeburg and was just re-elected for his second full term as Trustee from the Eighth District.
At Large Member, Executive Committee	*J. Chris Hawk, III, M. D.* Dr. Hawk is in the private practice of General Surgery in Charleston and has served on the Board of Trustees since 1985.
Clerk:	*Edward W. Catalano, M. D.* Dr. Catalano is a Pathologist from Columbia and was just elected to the Trustee positior

123RD PRESIDENT OF SCMA - WALTER J. ROBERTS, JR., M. D.

Walter J. Roberts, Jr., M. D., of Columbia, was sworn in Saturday, April 26 as the 123rd President of the South Carolina Medical Association. The ceremony took place during the Presidential Banquet.

Dr. Roberts, a graduate of the University of South Carolina and the Medical University of South Carolina, has been in the practice of internal medicine for over 25 years. A native of Columbia, he is active in a number of professional and civic organizations. He is a Past President of the Columbia Medical Society, has served as SCMA Vice Speaker and Speaker of the House of Delegates, is Vice Chairman and member of the Board of Directors of the Joint Underwriters Association, and is on the Board of Visitors of MUSC.

Dr. Roberts and his wife Nancy have four children.

DELEGATES REAFFIRM COMMITMENT TO TORT REFORM IN SOUTH CAROLINA

The House of Delegates, on Sunday morning, unanimously approved the following Resolution, submitted by the SCMA Board of Trustees:

> THEREFORE BE IT RESOLVED, *That the House of Delegates reaffirms its commitment to achieving meaningful changes in the tort laws of this state until the task is completed, and pledges the necessary financial support in the form of assessment on all the physician members of the SCMA and encouragement of contributions from all non-member physicians in the state.*

SCMA "VIGOROUSLY OPPOSED" TO DUMPING OF TOXIC WASTE

Delegates acted quickly on a Resolution from Sumter-Clarendon-Lee Medical Society and voted continued opposition to the dumping of toxic waste from other states in South Carolina. The Resolution called for the SCMA to oppose such practices by whatever means available in order that the public health of the citizens of the state not be placed in jeopardy.

OTHER RESOLUTIONS

Other Resolutions approved by the House of Delegates include the following:

- Approved efforts to have unused funds from physicians' licensing fees allocated to the State Board of Medical Examiners for the purpose of funding a rehabilitation program for the impaired physician.

- Approved attempts to have HCFA take whatever action necessary and proper to end or terminate any activity on the part of Blue Cross and Blue Shield of South Carolina which creates a conflict of interest between its role as Medicare fiscal agent and as a provider of health care services.

- Approved SCMA should "strongly urge" any hospitals which have signed or are considering signing contracts with Blue Cross PPC remove the "Exclusive Arrangement" clause from all future contracts.

- Approved attempts to have health care insurance companies in South Carolina provide coverage, as an option, for mental disorders which is identical in all aspects to coverage offered for other types of medical disease.

- Approved encouraging all South Carolina physicians to continue to treat Medicare patients but to accept assignment on a case by case basis only, based on individual need and circumstance. Additionally, the SCMA should devise a system that puts the patient in direct contact with the Medicare carrier when there are undue delays or disputes regarding disbursement; and this Resolution should be submitted to the American Medical Association.

The SCMA Board of Trustees will consider appropriate actions to be taken to follow through on those matters approved and/or recommended by the House of Delegates.

SCMA AWARDS FOR JOURNALISM EXCELLENCE

The SCMA Journalism Awards were presented to recipients during the closing session of the House of Delegates. New this year was an award for broadcast health reporting, presented to Ann Davis, WIS, Channel 10, Columbia. Ms. Davis' winning entry, titled "Fear of the Unknown," was a series of reports and interviews regarding AIDS. The print journalism award was presented to Ms. Kathryn Smith of the *Orangeburg Times and Democrat* for her story, "Windows on the Body," dealing with diagnostic imagery and advances in the field of radiology. Ms. Davis and Ms. Smith received plaques and a complimentary weekend in Charleston.

SPECIAL GUESTS

The SCMA was pleased to host a number of special guests during the Annual Meeting. AMA President, *Harrison Rogers, M. D.*, addressed the House of Delegates at the opening session on Thursday. *Mr. Roy Pfautch*, nationally known political consultant, was the distinguished speaker at the SOCPAC luncheon. Joining others at the SOCPAC luncheon were *Mr. Pete Lauer*, Executive Director of AMPAC, and *Thomas Berglund, M. D.*, Chairman of the AMPAC Board of Directors.

I. S. Leevy Johnson, President of the S. C. Bar, and Mrs. Johnson, joined the SCMA Board of Trustees at breakfast on Saturday morning, April 26; and *Mr. Bud Wright*, Division of Medical Society Relations of the AMA, was present for most of the meetings of the Board and House of Delegates. *The Reverend Ed Davidson*, Pastor of the St. George United Methodist Church, gave the invocation at the Presidential Banquet Saturday evening, and *Kenneth Cosgrove, M. D.*, President of the N. C. Medical Society, was the SCMA's guest during the weekend.

The SCMA Board of Trustees hosted members and staff of the State Board of Medical Examiners for luncheon on Wednesday, during which items of mutual interest and concern were discussed.

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NEW $100,000 PRIZE FOR ADVANCEMENT IN CHILD HEALTH CARE

Ronald McDonald Children's Charities will award $100,000 to the physician or health care professional whose work has contributed the most to the health and well-being of children. The award will be presented in the fall of 1986 at the opening of the 100th Ronald McDonald House on Long Island. Deadline for nominations is June 30, 1986. *Nominations should be mailed to: Gerald Newman, President, Ronald McDonald Children's Charities, McDonald's Plaza, Oak Brook, IL 60521.*

AMA NEWS

The American Medical Association has developed its first National Forum for Employed Physicians, to be held on June 14, 1986 in Chicago. For reservations, call toll-free, 1-800-621-8335. Enrollment is limited, pre-registration is required.

The AMA has announced a new program in its roster of benefits available to members -- the AMA Members-Only Professional Services Account, a credit card processing system which will allow AMA members to accept Visa and MasterCard payments from their patients and have the added benefit of a very low processing fee. Doctors who participate will pay a $50 annual fee plus a 1.98% discount rate, the processing fee for charges transacted. Additional information is available from *Lorna Wunderman (1-312-645-4785) or Mara Treshansky (1-312-645-4969).*

CARDIOVASCULAR KNOWLEDGE, RISK REDUCTION BEHAVIORS, AND ATTITUDINAL CHARACTERISTICS OF SOUTH CAROLINA HIGH SCHOOL SENIORS, 1985*

MURRAY L. VINCENT, Ed.D.**
ROGER SARGENT, Ph.D.
GAIL JOHNSON, M.S.

Since 1950 deaths from cardiovascular diseases have declined by more than 35 percent.[5] Most would attribute the change to improved health practices of the American population.[3] However, still there are more than one million deaths due to heart, lung, and blood diseases which account for more than 55 percent of all deaths.[6] To further reduce this epidemic of lifestyle related disease the adoption of appropriate behaviors during childhood and adolescence is essential. The health habits of maintaining a best weight, not smoking, establishing a proper diet, and exercising regularly have been recommended for the prevention of the major causes of morbidity and mortality.[9]

There is evidence that heart health education for school-aged children is on an upturn. However a recent review of literature concluded that there is a tremendous need for heart health education for children and adolescents. This recommendation was based on studies indicating an insufficient knowledge in this age group to make healthful decisions for disease prevention.[4] Many argue that schools could play a much more important role in heart health education.[1, 2, 10, 11] This descriptive study was initiated by the Heart Health Education of the Young Work Group, in the South Carolina Affiliate of the American Heart Association. Specifically, the study was designed to assess the cardiovascular knowledge, health attitudes, health behaviors, and anthropometric characteristics and dietary practices of a random sample of South Carolina high school seniors.

SAMPLE SELECTION AND TESTING PROCEDURES

Subjects in the study were 902 South Carolina high school seniors enrolled in 22 public schools in the spring semester, 1985. Racial makeup was: non-white males — 21 percent, white males — 25 percent, non-white females — 20 percent and white females — 34 percent. Mean age of all subjects was 17.58 years. Subjects were tested as the result of random selection of high schools and then random selection of two senior homerooms within each school. S. C. Heart Association Area Directors and county unit volunteers conducted the testing sessions following standardized protocols to insure anonymity and completion of all question items.

TESTING INSTRUMENTS

Cardiovascular Knowledge — The National Examination of Cardiovascular Knowledge (NECK) test, Form 1-A, was used. This instrument was developed by the American Heart Association subcommittee on Health Education of the Young and the National Heart and Blood Vessel Research and Demonstration Center at Baylor College of Medicine and was made available in 1984. NECK is a 60-item norm-referenced test measuring knowledge of cardiovascular function and prevention strategies to include: (1) Risk Factors of Cardiovascular Disease, (2) Cardiovascular

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Support for this study was provided by the South Carolina Affiliate of the American Heart Association. Special thanks are due to the professional staff of the Affiliate, county unit volunteers, the Heart Health Education of the Young Work Group and Drs. Russell Pate and Marion T. Carr. This is a summary report of large quantities of data. Readers are urged to contact the authors for more specific data and interpretations.

Disease, (3) The Heart and Circulatory System, and (4) Warning Signs and Emergency Procedures for Heart Attack and Stroke Victims. The norm means and standard deviations established from testing 3,336 9-12th grade students in four states are 28.74 and 8.95 for 12th graders and 29.06 and 8.66 for 9-12th graders.

Behavior and Attitude Self-Report — Faculty members from the College of Health, University of South Carolina, prepared an addendum test instrument to precede the administration of the NECK testing. Initial demographic questions for sex, race, age and school were followed by specifying height and weight and self-reported behaviors of exercise patterns, substance use and a weekly dietary recall. Dietary intake was determined by using a modified version of the Dietary Intake Form developed by Strohmeyer, Massey and Davison.[12] Respondents reported weekly intake frequencies of specified servings of dairy products, meat and legumes, fruits and vegetables, and breads and cereals. Body mass was determined using the recently reported most accurate indication of relative weight, the (WLI) weight for length index (Durant and Linder, 1985).

$$WLI = \frac{\dfrac{\text{Actual weight (kg.)}}{\text{Actual height (cm.)}}}{\dfrac{\text{50th percentile expected weight (kg.) for age}}{\text{50th percentile expected height (cm.) for age}}}$$

RESULTS

Cardiovascular Knowledge. Mean scores on the NECK test for South Carolina twelfth grade students are shown in Table 1. The mean for all students was 30.12 indicating an above-average comparison to the national norm of 28.75 for twelfth graders. In order of knowledge response, the mean for white females was 33.97, white males scored 31.40, non-white females scored 27.22 and non-white males scored 25.59. White females and white males answered 56.61% and 52.33% of the questions correctly while non-white females and non-white males answered 45.36% and 42.66% of the questions correctly. The range of within school mean scores including both sexes and races was a low of 22.67 to a high of 33.33.

Behavioral and Health Status Behaviors. The amount of information acquired in the behavioral self report question items is extensive and too lengthy to present in this paper. Table 2, however, provides a summary of the percentages of students which fall into behavioral and health status categories deemed negative to quality of life and contributing to cardiovascular risk.

Table 1
MEAN AND PERCENT CORRECT SCORES ACHIEVED BY S. C. HIGH SCHOOL SENIORS ON THE NATIONAL EXAMINATION OF CARDIOVASCULAR KNOWLEDGE TEST,° BY SEX AND RACE, 1985

Sex	*Race*	*N*	$\bar{X}$	*% Correct*
Males	White	215	31.40	52.33
	Non-White	187	25.59	42.66
	Total	402	28.67	47.78
Females	White	296	33.97	56.61
	Non-White	175	27.22	45.36
	Total	471	31.45	52.41
Total South Carolina		875°°	30.12	50.20

NECK National Norms
12th Grade 28.74
9-12th Grades 29.06

° 60 items, American Heart Association
°° 875 usable answer forms of the 902 respondents

Exercise, or the lack of, is a known cardiovascular risk factor. Based on the accepted standard that vigorous exercise should occur at least three times per week for maintenance of health, one might conclude that over one-half of the respondents are essentially sedentary. Both white and non-white females exceed males in reporting exercise behaviors less than three or more times per week. The physical inactivity of females is most pronounced among non-whites with 73 percent exercising less than three times per week. Sixty-three percent of the white females were also in the inactivity category. One-third of the non-white females report "none" as their physical activity in the past week while 17 percent of the white females chose this response. White males reported more physical activity than non-white, thus 70 percent of the white and 60 percent of the non-white males meet the standard of 3+ bouts of vigorous physical activity per week. Questions regarding interscholastic and intramural participation in physical activity programs further confirm that about 80 percent of the females are inactive while slightly less than one-half of the males are involved with white males participating slightly more than non-white males.

Table 2
NEGATIVE HEALTH BEHAVIORS REPORTED AND OVERWEIGHT/OBESITY STATUS OF SOUTH CAROLINA HIGH SCHOOL SENIORS, BY SEX AND RACE, 1985

	Non-White Females	*White Females*	*Non-White Males*	*White Males*
Exercising less than three times/week	73.1%	63.4%	39.9%	29.8%
Smoking 1+ cigarettes per day	8.1%	23.2%	16.2%	23.8%
Use chewing tobacco/snuff currently	2.3%	.4%	11.5%	27.7%
Consuming 1+ alcoholic drinks/past week	16.7%	41.4%	36.2%	50.2%
Overweight and Obese Status by *Weight Length Index* measure ...	31.9%	20.7%	30.5%	29.6%

Substance use/abuse of the respondents was addressed through questions designed to assess their cigarette smoking, smokeless tobacco use and alcohol consumption. Cigarette smoking was reported more frequently by whites with 24 percent of the white males and 23 percent of the white females smoking one or more cigarettes per day. Sixteen percent of the non-white males and eight percent of the non-white females reported smoking one or more cigarettes per day. Smokeless tobacco use is primarily a male phenomenon with 28 percent of the white males reporting the use of either chewing tobacco, snuff or both items. Non-white male responses suggest about 12 percent use one or both smokeless tobacco items.

Alcohol use, as reported, indicates white males as the primary consumers since 50 percent claim to drink one or more drinks per week. White females (41%) follow as the next group of consumers which is slightly above non-white males (36%) and significantly more than the 17 percent of non-white females reporting consuming one or more drinks per week. Of interest, but not included in Table 2, was the report of consuming six or more alcoholic drinks per week. White males (28%), white females (16%), non-white males (13%) and non-white females (1%) reported this rather high degree of alcohol use, most of whom are doing this illegally.

Overweight/obesity status was calculated from the self report of height and weight. Non-white females were found to have the greatest number overweight (32%) and similar to non-white males (31%) and white males (30%). White females (21%) were significantly less in overweight status than the other three groups. Not shown in Table 2, but of interest, is the 28 percent of white females falling into the underweight category. The 28 percent of the white females in this category contrast to the underweight status of non-white females (17%), non-white males (14%) and white males (11%). In all categories by race and sex, over one-half of the sample can be categorized as in the normal weight category.

DISCUSSION

Initial review of the NECK test results by South Carolina high school seniors might lead one to feel comfortable since they achieved better than the mean established for the nation. A mean score, however, is a measure of central tendency indicating the "average." Unfortunately the "average" score achieved by seniors in South Carolina, and the nation, reflects a level of ignorance which is unacceptable in light of current mortality and morbidity data.

A review of the knowledge areas is probably more crucial than thinking only of mean score achievement. Mastery of knowledge has many implications in terms of applying such information in daily behavioral practices. Of 22 questions relative to risk factors, 12 were missed by more than one-half of the respondents. Eight of 12 questions designed to assess knowledge of cardiovascular disease characteristics were incorrectly answered by more than one-half of the respondents. Eight of 13 questions related to structure of the heart and circulatory system were incorrectly answered by more than one-half of the respondents. Questions regarding warning signs and emergency procedures were answered correctly more frequently than the three other categories. Of 13 questions, only four were incorrectly answered by more than one-half of the respondents.

Basically, the respondents do not appear to understand technical terms, specific functions or the relationship between parts of the circulatory system. More significant, however, is the ignorance of susceptibility in that they are deficient in identifying those factors placing them at high risk. It seems fair to assume if one does not know the risk factors then one would not perceive being at risk or have the ability to reduce risk. It is presumptious to assume that knowledge or ignorance alone will be the only determining factor resulting in positive or negative health practices. One can easily recall individuals lacking knowledge who indeed practiced positive health behaviors, and conversely, those with knowledge who smoke, fail to exercise, never see a physician and have a poor diet. However, our cultural belief in the value of knowledge guides us all to attend school, read, inquire and arm ourselves with as much information as we are capable to lead constructive and beneficial lives. The absence of cardiovascular knowledge is a deficiency which detracts from one's ability to make informed choices. Unaware of the severity of a disease, not understanding the association of risk factors to a disease entity, not understanding that risk can be lessened through positive lifestyle behaviors and not having the skills to practice positive behaviors, all contribute to the perpetuation of cardiovascular disease as our number one killer. This is indeed unfortunate since most authorities support the benefits of prevention and view many cardiovascular events as preventable.

The self-reported behaviors of these high school seniors provide a general estimation of health status and practices having implications for assessing cardiovascular risk. Relative weight, exercise patterns and dietary intake of the study respondents do not dictate the progressive level of the atherosclerotic process, however, such indicators are reasonable predictors if the behaviors persist over time.

Whereas young post-adolescent and middle-age Americans have begun to exercise frequently, the results of this study indicate the sedentary behaviors of these adolescents. Of specific interest is the response to the question as to whether they had exercised in the past seven days to cause sweating and elevated breathing. The basis of this question is the standard guideline that an exercise maintenance program should include at least three sessions per week for 30 minutes each session. This low level of physical activity reported, and consequent low level of caloric expenditure, partially explains the degree of fatness/obesity observed. Recognition of the benefits of exercising do, however, exist since 85 percent of the females intend to exercise more in the future.

The comparisons of substance abuse by race pose some interesting questions. The more frequent use of cigarettes, smokeless tobacco and alcohol by whites may reflect the socio-economic differences of the races. Twice as many white males (18%) as non-white males (10%) report smoking six or more cigarettes per week. White females (17%) report smoking six or more cigarettes per week four times as much as non-white females (4%). Comparisons to national studies of smoking prevalence can be made. "Current regular smokers," as defined in the nationwide 1979 study of teenage smoking, includes those smoking one or more cigarettes per week.[7] The 1979 prevalence for 17-18 year-old males was 19.3% and 26.2% for females. South Carolina data for 1985 shows prevalence rates for "current regular smokers" as follows: non-white males — 16.2%, white males — 23.9%, non-white females — 8.1%, white females — 23.2%. The 1983 NIDA nationwide study of high school seniors[8] showed that 13.1% of the males and 13.6% of the females smoking a half pack per day. South Carolina half pack per day smokers were as follows: non-white males — 4.3%, white males — 12.4%, non-white females — 1.2%, white females — 10.0%. Based on these comparisons to two national studies, cigarette use by South Carolina seniors appears to be less frequently practiced. White males reporting the consumption of six or more drinks of alcoholic beverages per week were twice as great as non-white males (28% to 13%). White females, using the same consumption rate of six or more drinks, report 16 times as much use as non-white females (16%-1%). NIDA[8] studies of 1983 high school seniors showed 93 percent had tried alcohol once and 69 percent had used alcohol in the past month. Question format in this study referred to alcohol use in past week, thus, making comparisons difficult.

The precise level of overweight that places the individual at risk for disease is unclear. Some estimate that risk may well begin at five percent above ideal weight. In every group sampled at least one in five were overweight or obese. The lowest percentage of overweight and obesity was

observed in white girls. About one-third of white and non-white males and non-white females are overweight or obese.

Obesity is of particular concern to this age group not only from a fitness-cosmetic aspect but more importantly as a risk factor for diabetes, hypertension, cardiovascular disease and some types of cancer. An argument could be made that of equal importance is the personal dissatisfaction that accompanies the overweight person. Ninety-five percent of non-white and all white obese females wished to lose weight. Expectations for trim female bodies play a great role in weight loss efforts beginning in this age group. An indication of cultural pressure is indicated by almost three-fourths of normal and underweight white females desiring to lose weight. Males did not illustrate this desire although it should be noted that about twice the number of whites as non-whites wished to lose weight. This is supported by the indication that white males were about one and one-half times as likely to think that they were slightly overweight or overweight as were the non-white males. This is even more interesting when it is noticed that there is no difference between the races in male weights while non-white females are significantly heavier than their white counterparts.

CONCLUSIONS

The reader of this report should recall some important characteristics of this study. Namely, the subjects were tested approximately two months prior to their graduation from high school. Secondly, the random sampling protocols allow the authors to generalize the results to the entire population of high school seniors in South Carolina in 1985. This suggests that the knowledge levels and reported behaviors of the sample subjects essentially describe the characteristics of those earning a high school degree and who have since entered college, become employed, married and are the "educated" adults in South Carolina. Naturally, one can only speculate as to how the school dropouts would have responded to this testing session. It is probably fair to assume that dropouts are less literate, less knowledgeable and perhaps more prone to the practice of unwise health behaviors. If such is the case, those dropouts are even less capable to determine and practice wise health choices and more likely will nurture our high ranking as a state with significant behaviorally related health problems.

The state and national movement toward improvement in computation, language and writing skills is highly commendable. Productivity in a profession or vocation, however, will be limited by diseases and conditions which drain the energies of individuals. Perhaps even more important is the relative quality of life which suffers due to a preventable death or disability. The absence of knowledge regarding cardiovascular diseases, risk factors, heart/circulatory system and warning signs/emergency procedures, evident in the NECK testing, functions to deprive South Carolina youth. Without knowledge they will be less capable in making informed choices, thus reducing their chances to carry on a healthy life. Inadequate knowledge means not understanding their susceptibility to disease, not understanding how to select and prepare foods, having distorted body images, not understanding the benefits of aerobic physical activities, not recognizing a warning symptom and seeing a physician and not providing a positive heart-healthy environment for their children. Learning to read, write and compute are essential skills for survival. Isn't it feasible and logical that in the process of mastering basic educational skills our youth can learn about the integrity and maintenance of the cardiovascular system which provides our lifeblood?

The data reported suggest the need for multiple interventions. Schools obviously can improve the quality, and increase the quantity, of health-related learning experiences. Kindergarten to high school seniors can benefit from organized comprehensive health education programs taught by competent and academically prepared teachers. Physicians and other health providers can implement more patient education programs with preventative emphases. Behavioral change is the essential key to the promotion of positive healthy lifestyles and the prevention of undesirable cardiovascular disease outcomes. □

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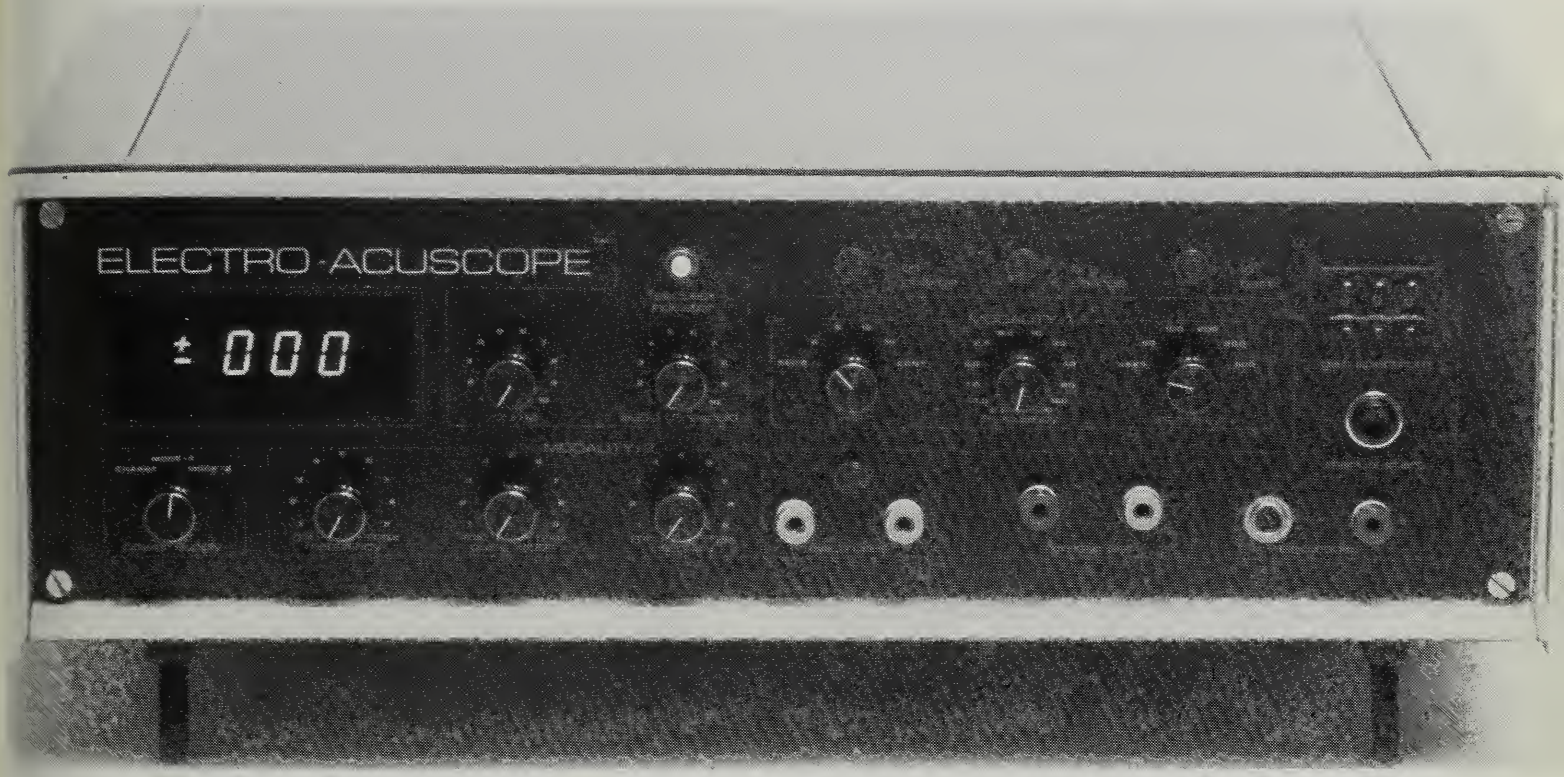
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Editorial

CRYPTOSPORIDIOSIS

Guest editorials reflect the opinions of the authors and do not necessarily reflect the opinions of the Editorial Board and the South Carolina Medical Association.

— CSB

Cryptosporidium is a tiny intestinal protozoan parasite which can infect many animal species and more recently has been shown to cause gastroenteritis in humans. In this issue of the *Journal*, Dover et al report that *Cryptosporidium* was the most common parasite identified at the Medical University of South Carolina Parasitology Laboratory during 1984. This survey finding confirms recent reports that cryptosporidiosis is an important newly recognized cause of human diarrheal illness.[1]

In normal individuals, *Cryptosporidium* infection usually causes watery diarrhea which is often associated with nausea, vomiting, and abdominal cramps. The symptoms typically last five to ten days and can be seen in persons of all ages. There have been several reports of infection in returning international travelers and children in day-care centers and their families. Most of the South Carolina cases have been acquired within the State. Transmission can be through contaminated water or from person-to-person or animal-to-person spread via the fecal-oral route.

As with some other newly discovered diseases, the pathogenesis and mechanisms of immunity are still unknown. There are also gaps in our knowledge about the acquisition of *Cryptosporidium* from the environment. Since many animal species have been found to be naturally infected, it is likely that certain animals, such as the domestic cat, may play a role in some cases.

The disease in patients with the acquired immunodeficiency syndrome (AIDS) is frequently quite different. In these patients intestinal cryptosporidiosis can become chronic leading to severe malabsorption and weight loss due to the chronic watery diarrhea.[2] A few AIDS patients have also been found to have the organism in the respiratory tract. This has been demonstrated at autopsy in several patients but they have always had another opportunistic infection which could account for the severe respiratory symptoms. I have a patient, for example, who survived respiratory cryptosporidiosis and is quite well following treatment for his *Pneumocystis carinii* pneumonitis. Thus, the pathogenesis of respiratory disease needs further investigation.

There is no proven effective therapy for cryptosporidiosis. Fortunately in non-immunocompromised hosts the disease is usually self-limited. Supportive care with antiemetics and antispasmotics (Bentyl) has helped in some cases. If dehydration cannot be prevented by oral fluids, intravenous rehydration should be started. In AIDS patients, the investigational drug Spiramycin has been used with some success but is not always effective.[3]

Diagnosis is most easily made by identifying the *Cryptosporidium* oocysts in the stool of infected persons using cold Kinyoun's acid fast stain or some other similar method.[4] It is recommended that all laboratories performing parasite examinations on stools become familiar with the appearance and staining characteristics of this protozoan. Intestinal biopsy is another way diagnosis can be made but is usually not necessary.

Once we all begin to look for this organism in South Carolina, we will likely find that some of those enigmatic cases of persistent diarrhea will be due to this parasite. I would also suggest sending reports of cases to DHEC to help establish the extent of this infection in our state.

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LETTER TO THE EDITOR

"TO THE BEST OF MY MEDICAL EXPERTISE: BEFORE THE FINAL VERDICT"

Editor's note: The following piece was written by Dr. Stafford at 2 AM on the morning of his verdict and expresses the anguish experienced by all physicians in the course of malpractice litigation.

— CSB

Whether the verdict be *yes* or *no*,
The fact that just having to be here
is what makes it even sadder . . . !

To try our best at whatever we do,
is the most that we can ever do.
In Obstetrics, our aim, like no other,
is to have a healthy baby and mother.

There are times when fate will intervene.
It's presence causes what's to be seen!
Irrespective of this
we still must try our best,
To make a choice and pass the test.

In each choice of endeavor,
I'm sure there is risk;
but after this week
of trial and tribulation;
I'm afraid to say there will never be
as much elation.

After fifteen years, to see the faces
of new mothers and fathers
could bring no greater thrill;
but this week of threat to my integrity,
has created a chill.

No matter what the outcome,
I'll never feel the same,
To deliver a newborn,
will always seem like a game!

I guess what I'm thinking,
is what I feel it's all about;
If God had malpractice insurance,
my practice and family wouldn't suffer,
when babies are not perfect.

It's a shame that sympathy and concern
must be mixed with anger and vindictiveness.
There's no doubt the parents
feel desperate and bad;
But nevertheless — I FEEL HAD !!!

Thanks to my defense lawyers,
and the rest of the team,
They've saved me and my family
from being totally bereaved.

I hope for the future, the practice of medicine
can be saved,
As a profession to have pride in,
and not seem depraved.

Even though innocent of malpractice,
there's still a great cost
Away from family and patients to defend this
accost.
Somehow the system must definitely change
So that doctors and patients alike,
Are not afflicted with outrage.

If the system isn't changed,
Then heaven forbid . . .
Women and their offspring will
Forever be rid
Of the concern of doctors who love and care.

We don't try to seem god-like,
with ultimate agility,
We just try our *best* to the *best*
of our ability!

NEXT DAY.
WE WON ???

Robert H. Stafford, M.D.
Columbia, S. C.

ON THE COVER:
WALLER HUNN NARDIN, M.D.

In 1893, Waller Hunn Nardin, M.D., served as President of our state medical association. He had worked his way up through the ranks and had served in numerous areas of both local and state medical politics. At his inaugural address, Dr. Nardin discussed the duties and responsibilities of physicians and encouraged membership in organized medicine, even at that early date. He was particularly interested in and addressed the subjects of the State Board of Health and Medical Examiners.

Dr. Nardin is listed as one of the physicians to receive the honor of being included in the first volume of the *Encyclopedia of Eminent and Representative Men of the Carolinas of the 19th Century* published in 1892.

Dr. Nardin was born in Charleston, South Carolina, October 24, 1837. He was the son of David Frederick Nardin, M.D., who had emigrated to the US from France. Dr. Nardin (senior), was one of the many who died in the yellow fever epidemic of 1838. Waller H. Nardin, M.D., was only a year of age when his father died of yellow fever and at that time his mother removed the family from Charleston to Anderson, South Carolina, where young Nardin was reared. His early education was that of traditional Latin and Greek and at the completion of his primary studies, he entered the University of Virginia in 1858. He took his medical training at the University of New York and upon completion, returned to practice medicine in Anderson. He was well received and soon established a successful medical practice. In 1862, Dr. Nardin followed the course of many other patriotic southerners and joined the Confederate Army. Interestingly, he enlisted as a Private, but was soon promoted by the Secretary of War to serve as surgeon, a capacity in which he remained until the close of the war. He returned to Anderson and resumed his practice. In addition, he became very involved in local business and political endeavors. He became involved in his stepfather's business, and established the W. H. Nardin Company. However, the duties of his medical practice needed his full time attention and he retired from that business endeavor in 1873. He served as President of the Anderson County Medical Society and was President of the South Carolina Medical Association.

An active member of the Methodist Episcopal Church, he served as Chairman of the Board of Trustees. He was also involved in the Anderson Cottonseed Oil Company, the Anderson Shoe and Leather Company and was an original stockholder in the Anderson National Bank. He politically served as Alderman and later Mayor of the city of Anderson. After a successful career in medicine and having received the esteem and admiration of both professional and lay associates, Dr. Nardin died May 30, 1908.

— Thomas M. Leland, M.D., Ph.D.

FINANCIAL CHECKUP

MARTIN LEFKOWITZ
Certified Financial Planner
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Vol. 6, Issue No. 5 May 1986

ARE YOU PREPARED TO FINANCE A COLLEGE EDUCATION

The Clifford Trust

While many forms of the trust may be used to fund an education (i.e., spousal remainder trust, "Crummey" trust, etc.), the Clifford trust remains the most widely used. The Clifford trust is a short-term trust - but one that has a 10-year minimum life. A high-bracket taxpayer funds this trust with either cash or income-producing assets, and must part with this "trust property" for at least 10 years and one day.

Due to substantial tax savings that result - accumulated income is taxed at the child's low rate - funds accumulate much more rapidly than if you retained them yourself. For example, a dependent child with $5,000 in investment income this year would owe only $300 in federal income taxes. And even with $15,000 in investment income, that dependent would owe only about $2,000 in taxes.

The main advantage of the Clifford trust is control. After the 10-year period, the principal reverts back to the parent. The dependent keeps only the earned income.

Before establishing a Clifford trust, consult your CPA or attorney. He or she will be able to tell you whether it is your most sensible (and economical) approach. Principal assets cannot be removed from the trust until at least 10 years after the final installment has been made. Therefore, you may find that the trust is difficult to fund in installments. And, unless you are able to part with a large sum of money for 10 years, the trust may not be in your best interest.

The Uniform Gift to Minors Act

Perhaps you have a high income, but little in the way of liquid assets. And you want to take advantage of the tax benefits of income shifting. In this case, an outright gift to your child may be your most viable solution.

Married couples may make gifts of up to $20,000 ($10,000 for individuals) per year per child without having to pay a gift tax. If the gift is made before your child is legally an adult, the funds must be placed into a custodial bank or securities account for your child (where, because of your child's low tax rate, they will compound more quickly).

To ensure that these assets are not counted (and taxed) as part of your estate if you die before your child reaches maturity, you might want to name someone other than yourself or your spouse as custodian.

Perhaps the biggest advantage of the custodial account is that it offers a less complicated means of funding a college education. Although the account is established in trust form, it is not a trust. Therefore, it can be established without an attorney.

The biggest drawback to the custodial account is, however, its lack of control. In direct contrast to the Clifford trust, the custodial account is an irrevocable gift. The account becomes the outright property of your child at the age of maturity (usually age 18, but in some states 21), to be used as your child deems best. You may find yourself having to persuade your child to spend the money on college, instead of a trip to Europe or a new Trans Am.

Investing for Growth

Once you've decided to establish a trust or a custodial account, you'll want to select a funding vehicle. How do you choose from the wide variety of investments on the market today? In general, high-yielding, taxable investments are the most advantageous (the income they generate will be taxed at your child's low income tax bracket and, therefore, you will enjoy the full benefits of income shifting).

Zero in on Your Children's Future

Zero coupon securities have proven an immensely popular educational funding vehicle over the past few years. That's becuase they enable you to plan for the future at today's prices. Zeros provide capital growth and safety. They are purchased at substantial discount from their face value, then they pay full face value at maturity. The term "zero coupon" simply means that you receive no cash as current interest. Rather the interest accrues in the form of appreciation. And zeros offer the security of receiving a predictable return, and of receiving it at a future date you have predetermined. You have the ability to select from a wealth of maturities with the knowledge of how much your investment will be worth at the date you specify.

Today, zeros are proving more popular than ever before. Virtually no other investment enables you to lock into a yield for as long as 30 years. And they are growing in availability and in form. At Hutton, you can select from a wide variety of Government-backed securities, certificates of deposit and taxable and tax-exempt bonds.

Zero Coupons Based on Government Securities

Zeros based on U.S. Treasury obligations - Treasury Bond Receipts (TBRs), Certificates of Accrual on Treasury Securities (CATS) and Treasury Interests (TINTs) - are the safest and most popular. The appreciation they offer has recently equalled up to twenty times the amount of the original investment, depending on maturity.

TBRs and CATS entitle you to interest of principal payments of U.S. Treasury Bonds purchased by Hutton and placed in custody with a major bank. TINTs, on the other hand are direct obligations of the U.S. Government. They are sold in multiples of $1,000 face amount. And they offer more liquidity than any other taxable zero coupon security.

Zero Coupon Certificates of Deposit

Zero coupon CDs are insured by either the FDIC or the FSLIC, both of which are instrumentalities of the U.S. Government, for up to $100,000 per client. Their maturities generally range from 6 - 15 years and E.F. Hutton maintains a secondary market, thereby enabling you to liquidate your investment, if necessary, before it matures (you may receive more or less than your original investment, depending on prevailing interest rates). At today's rates*, your investment can triple in 10 years and quintuple in only 15 years.

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*As of October 22, 1985.

SOUTH CAROLINA MEDICAL ASSOCIATION

AUXILIARY



Susanne Geist Black, M.D.
SCMAA President

"I expect to pass through this world but once. Any good, therefore, that I can do, or any kindness that I can show to my fellow creatures, let me not defer nor neglect it, for I shall not pass this way again."
— Stephen Grellet

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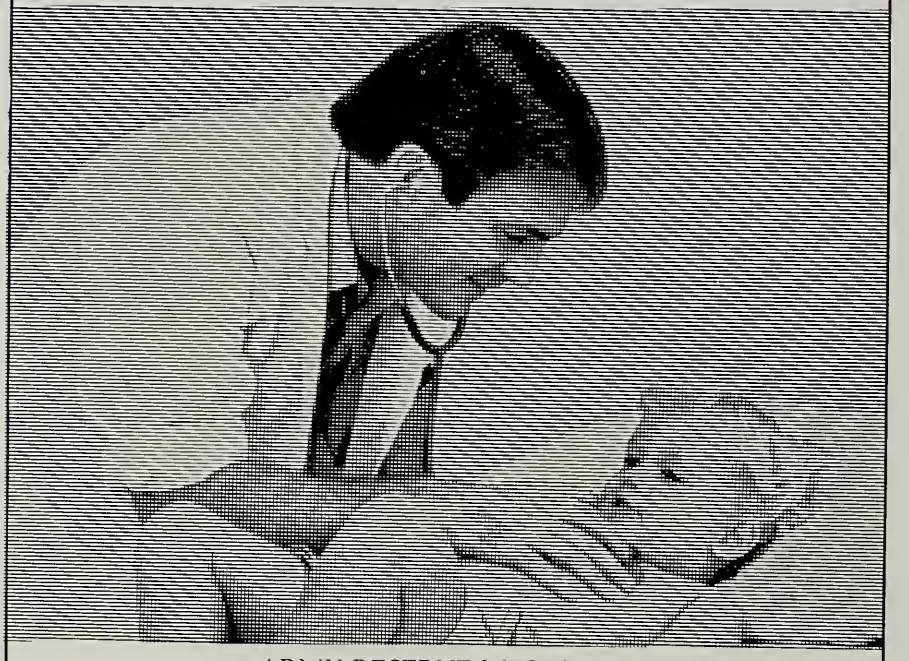
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President's Page



PRO-ACTIVISM — BUT WITH TASTE

The latest trickle down phrase from AMA to the state associations is "pro-activism." Physicians are encouraged to join up and participate, to become "involved." This means in politics, government, cultural and social endeavors which influence everyone's way of life. We are encouraged to register, vote, run for office; we should contribute, with our names, influence and prestige, as well as our money. We should become more visible, acting participants in community projects. This is "pro-activism."

At our recent House of Delegates Meeting, resolutions were passed which bring us into the arenas less familiar to us than our society meeting halls and our hospital staff rooms. For example, we are confronting Blue Cross/Blue Shield about a possible conflict of interest in acting as a fiscal intermediary for physicians, while at the same time, planning provider services which are in competition with private practitioners; we are suggesting the fashion in which physicians should or should not accept assignment of benefits for patients; we are indicating our willingness to become involved with government and with truly "big business" in the problems of toxic waste disposal. And, certainly, we are indicating our continued resolve to pursue meaningful changes in the legal system of this state, as it applies to court actions. This is "heavy stuff" and we are getting more attention and notoriety about it than ever in the history of medicine in this state.

Perhaps more than in any other profession our actions are subject to inspection by the public. It is also true, and not paranoid ideation, that we have our willing detractors, waiting to pounce on any perceived foible in our approach to a problem and to declare our motive self-serving. A recent newspaper account of our House of Delegates activities suggests that we are "eroding our image" to engage in such mundane pasttimes as protecting the fashion and atmosphere in which we desire to practice medicine. Such poorly contrived rhetoric shows that some will seize upon any departure into pro-activism and create jagged edges upon which to impale our noble profession.

Please understand, I endorse the proposed pro-activism. I am persuaded however, that these things must be done with care and taste. We must first be very knowledgeable about what we are undertaking. We must recognize that others have — and are entitled to — a point of view, and we must listen to it and weigh it. We must not appear arrogant. We must be patient. Especially in trying to achieve legislative change, I am finding that nothing succeeds like patience and tenacity.

Most important, however, we must work for things which are in the interest of our patients. If our motivation is to secure and maintain the proper atmosphere in which we can provide for our patients the best in medical care, including attention to the affordability of medical care, the effort will be viewed by all as worthwhile and will succeed — without "eroding our image."

"Pro-activism" — yes — but with taste.

Walt Roberts

— Walt Roberts

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THE JOURNAL
OF THE SOUTH CAROLINA MEDICAL ASSOCIATION
VOLUME 82 JUNE 1986 NUMBER 6

DETECTION OF NEURAL TUBE DEFECTS IN SOUTH CAROLINA*

JOANN C. KELLY, Ph.D.*
HAROLD A. TAYLOR, Ph.D.
R. CURTIS ROGERS, M.D.
LUCY H. PULLIAM, M.S.

Neural tube defects (NTD's) comprise some of the most common and most serious of all birth defects. The most frequent NTD's are anencephaly, spina bifida and encephalocele. Because of the severity of these birth defects, affected infants often die early in life. The survivors may have long term disabilities such as lack of bowel and bladder control, paralysis and mental retardation. Surgical repair of the defects and medical care of complications help to decrease the degree of disability.

Neural tube defects are second only to congenital heart defects among the common serious birth defects which occur in South Carolina. NTD's have been shown to occur in a generally increasing rate from west to east in the United States with South Carolina being in the highest incidence area.[1] The incidence for all NTD's based on birth certificate data has been reported to be around three to four per 1000 live births in South Carolina and one to two per 1000 nationwide. The exact causes of these defects are not known, but genetic and environmental factors are thought to be contributory.

Parents who have a family history of neural tube defects are at increased risk of having an infant with a similar defect. However, 95 percent of all cases of neural tube defects are born of parents who do not have a family history of these defects. The use of biochemical and ultrasound testing early in pregnancy can detect over 90 percent of all open NTD's. Ultrasound examination will detect nearly all anencephalics and approximately 80 percent of the open spina bifidas.[2] Testing of serum and amniotic fluid for alpha fetoprotein levels further increases the percentage of NTD's detected early in pregnancy.

Alpha fetoprotein is a protein normally produced in the yolk sac and the fetal liver and is present in the fetal circulation and amniotic fluid. Brock and Sutcliffe first observed that elevated amniotic fluid alpha-fetoprotein (AFP) was associated with open neural tube defects (anencephaly or spina bifida).[3] There is a false positive rate of approximately five percent; however, the use of acetylcholinesterase determination and ultrasonography[4] can, in most cases, distinguish abnormal fetuses from the normal fetus with false positive AFP levels. Other non-neural tube abnormalities may be associated with elevated amniotic fluid AFP (i.e gastroschisis, cutis aplasia, congenital nephrosis, fetal demise, etc.), but open NTD's are the most common. Alpha-fetoprotein is normally excreted by the fetus into the amniotic fluid. From the amniotic fluid, AFP gains limited access to the maternal circulation. Wald demonstrated that maternal serum alpha-fetoprotein (MSAFP) levels were usually increased in preg-

* From the Greenwood Genetic Center, 1 Gregor Mendel Circle, Greenwood, S. C. 29646 (address correspondence to Dr. Kelly).

nancies with open neural tube defects.[5] A collaborative study set up in the United Kingdom documented the relationship between open NTD's and elevated maternal serum AFP levels.[6]

Prompted by the high incidence of NTD's in South Carolina and the establishment of several successful maternal serum alpha-fetoprotein screening programs in the United States and the United Kingdom, the Greenwood Genetic Center began a pilot project in February, 1984 to study the feasibility of offering such screening in South Carolina.[7-12] The pilot project included 2,000 patients of participating physicians in upstate South Carolina. Private obstetricians in the pilot area were offered the opportunity to take part in the pilot project. All pregnant patients in the physicians' practices were offered free screening. Those wishing to participate had a blood sample drawn at 16 to 18 weeks estimated gestational age. Originally the study was limited to a six-county area surrounding Greenwood county but was expanded to include Spartanburg, Greenville, Anderson, Pickens and Oconee counties at the request of obstetricians in those counties. (Twenty-one groups of physicians from the upstate sent samples for analysis). In an effort to open lines of communication and start services as smoothly as possible, visits were made by the pilot project investigators to the offices of physicians who expressed a desire to participate in this project.

Patients with a family history of prior occurrence of an NTD or a history of some other defect of the spinal column were assigned to the high risk group. These patients were offered ultrasound examination of the fetus and amniocentesis to measure amniotic fluid AFP and acetylcholinesterase.

Patients with a negative family history for NTD's were offered the maternal serum AFP (MSAFP) test. A total of 2176 pregnancies were screened during the pilot project (Figure 1). An initial elevated MSAFP level was detected in 4.1 percent of the participating patients (90 patients). Six patients with highly elevated first serum samples proceeded directly to ultrasound examination, counseling and amniocentesis. The remainder of the patients with initial elevated serum AFP levels were offered a repeat test. Approximately half (or 1.8 percent of the screened population) had a second elevated level. Ultrasound examination initiated subsequent to a second elevated serum AFP in 45 patients detected five open NTD's, two fetal deaths, and eight sets of twins. Counseling and amniocentesis were offered to all patients with two elevated MSAFP tests and "normal" ultrasound examinations. Amniocentesis performed on 35 patients in this group (1.7 percent) detected one NTD and one abdominal wall defect.

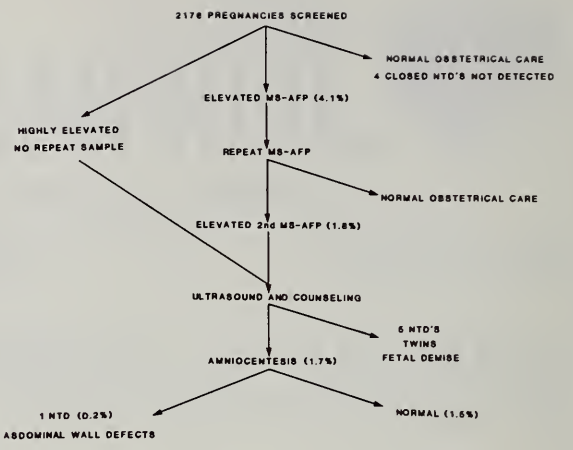


FIGURE 1. Scheme for neural tube defect screening.

A total of ten neural tube defects occurred in the screened population. All six of the open defects were detected with elevated MSAFP levels. The open defects included two anencephalics which were terminated, three open spina bifida (two terminated) and one open encephalocele. All open defects were confirmed at delivery. The four closed defects (three encephaloceles and one closed spina bifida) had MSAFP levels within the normal range, as would be expected. The distribution by county of the neural tube defects is shown in Table I.

About three hundred patients from Spartanburg county were included in the pilot project. Six of these were carrying infants with neural tube defects which gives an incidence of two percent, as opposed to the expected 0.2 percent. It will be interesting to see if this high incidence holds as

Table I
DISTRIBUTION OF NEURAL TUBE DEFECTS

County	*Screened*	*NTD's*
Abbeville	89	1
Anderson	312	1
Greenville	485	1
Greenwood	512	1
Spartanburg	299	6

additional pregnancies are followed. There were 19 patients in the pilot population with a history of a prior infant with a neural tube defect. Two of these 19 patients had elevated MSAFP levels and were found to be carrying infants with open spina bifida. Both of these patients are from Spartanburg county.

In the United States, the incidence of NTD's is approximately one to two per 1000 live births. It has become clear that the incidence of NTD's in South Carolina is considerably higher than the national level. The incidence found in this pilot project is 4.6 per 1000 pregnancies. Excluding all patients with a history of a prior infant with an NTD, (clearly, a high risk category), the incidence remains high at 3.7 per 1000. The reason for the high incidence of NTD's in South Carolina, and the extremely high frequency in Spartanburg county is not known at this time.

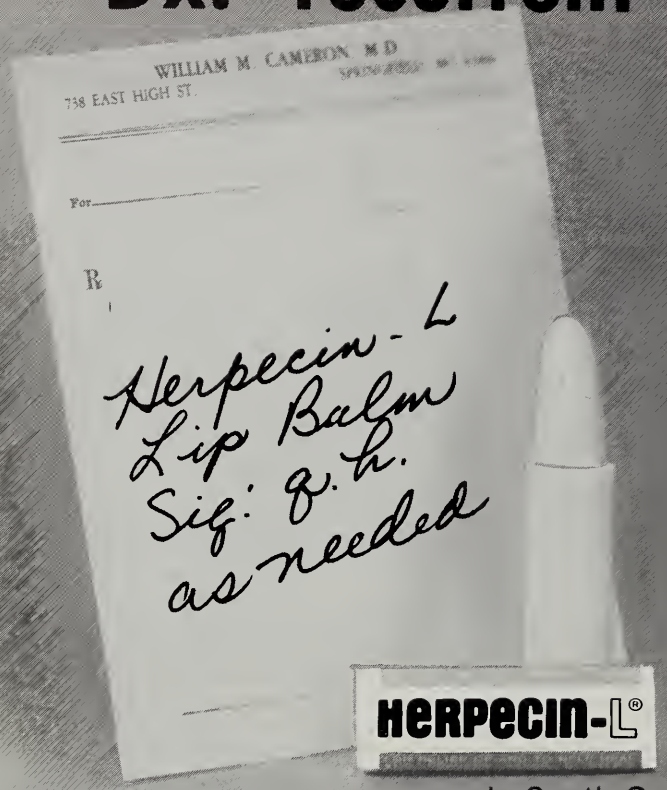
The cost of institutionalization and chronic care of an infant affected with a serious birth defect or severe mental retardation is at least $10,000/year. This does not include the cost of neurosurgical procedures and hospitalization which also are incurred in the treatment of a child with a neural tube defect. The projected lifetime medical care of a patient with spina bifida exceeds $250,000.[13] The total cost of this pilot project was $44,000 or less than $7,400 per open neural tube defect detected prenatally.

The results of this pilot project confirm the usefulness of the maternal serum AFP test for screening for neural tube defects in a high incidence population. Presently all three genetic centers in South Carolina (the Greenwood Genetic Center, the Medical University of South Carolina in Charleston, and University of South Carolina School of Medicine in Columbia) are offering full service screening for neural tube defects. This includes not only the MSAFP test, but also sufficient local standards to adequately interpret results, genetic counseling by trained counselors, amniocentesis evaluation and interpretation, as well as information and support for the participating physicians. □

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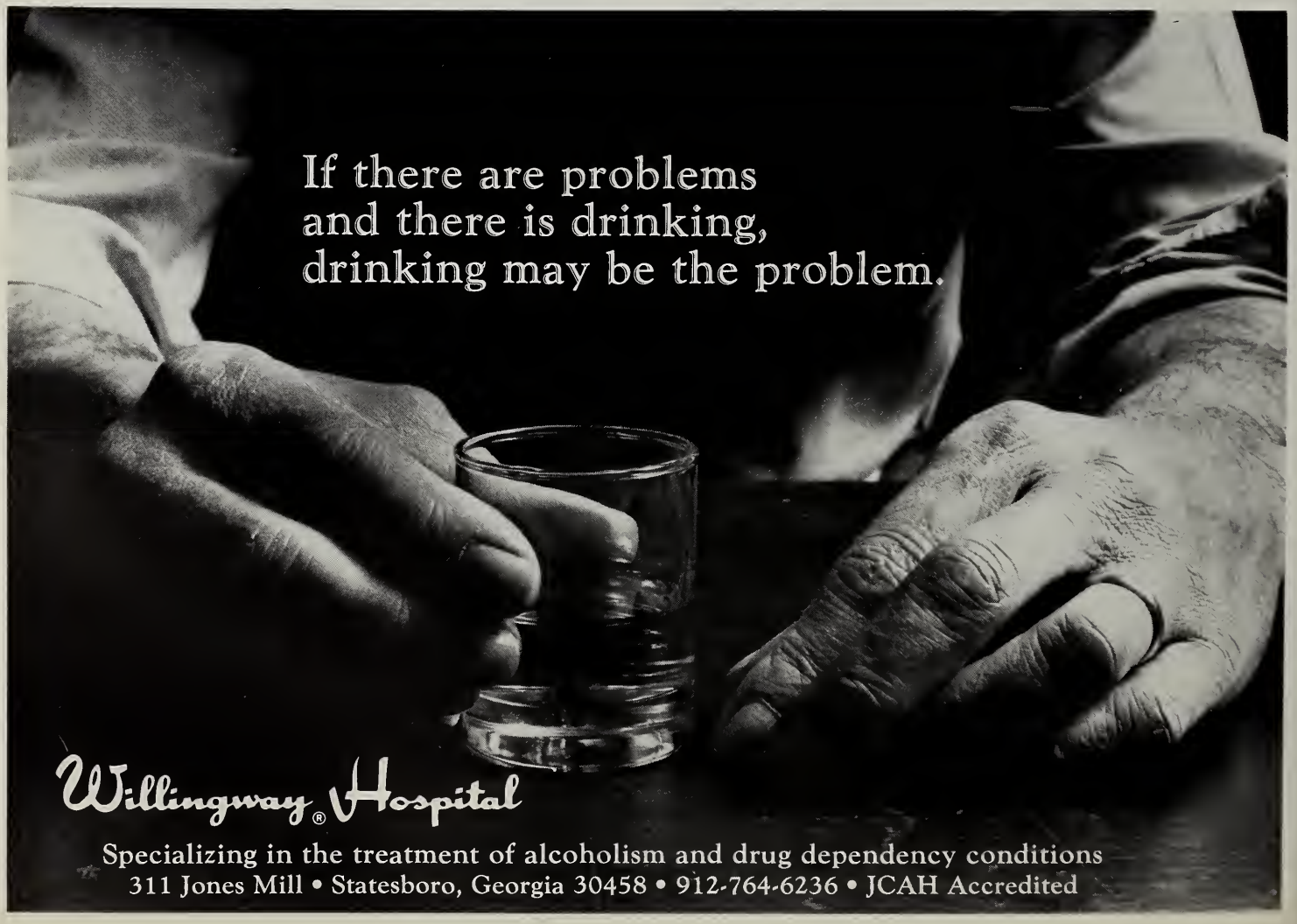
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THE USE OF INTRAVASCULAR GRAFT SIZERS IN VASCULAR SURGERY

JOSEPH HODGE, M.D.*

Abdominal aortic aneurysms, trauma, aortic-iliac-femoral-popliteal occlusive disease and other conditions are surgical lesions that require resection and arterial reconstruction with synthetic or vein autologous grafts. Macroscopic estimation or calipers have been used to determine the size graft to select during arterial reconstruction.

The purpose of this paper is to discuss an intravascular graft device that will measure the internal diameter and the cross section of the vessel, thus providing the surgeon with the accurate graft size necessary to complete arterial reconstruction.

MATERIALS AND METHODS

The intravascular graft sizers are made of aluminum, stainless steel or plastic, consisting of several dumbbell shaped devices (Fig. 1) with cylindrical, cone shaped graduated segments beginning with 6mm, 8mm, 10mm and 12mm markings on one limb of the dumbbell and 7mm, 9mm, 11mm, and 13mm, on the other limb. The second dumbbell has graduations of 14mm, 16mm, 18mm, and 20 mm on one end and 15mm, 17mm, 19mm, and 21mm on the other end. The third drumbbell measures 20mm and 21mm respectively. The limbs of the sizer may be slightly curved in order for easy introduction into the iliac or femoral vessels. (Fig. 2)

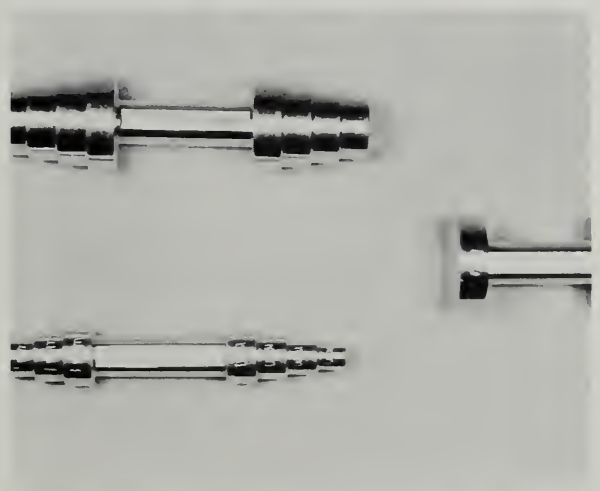
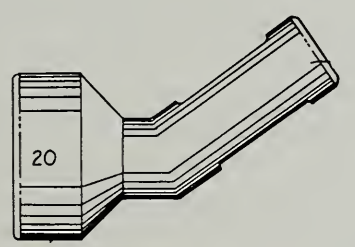


FIGURE 1. Aortic-iliac-femoral graft sizers.



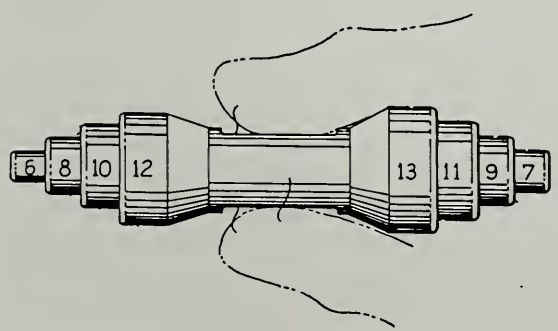


FIGURE 2. Curved graft sizers.

DISCUSSION

After resection of the diseased aorta, the graduated cylindrical sizers are easily introduced into the proximal aorta and distal outflow tract thus measuring both the diameter and cross sections of the vessels, thereby providing the proper size graft for reconstruction (Fig. 3). Grafts should approximate the diameter of the proximal aorta and the distal vessels to be anastomosed (Fig. 4). Synthetic grafts may be tubular or bifurcated and the bifurcation grafts measure 14mm x 7mm, 16mm x 8mm x 18mm x 9mm and 20mm x 10mm in diameter. Most have limbs with diameters half the

* 864 N. Church Street, Spartanburg, S. C. 29303.

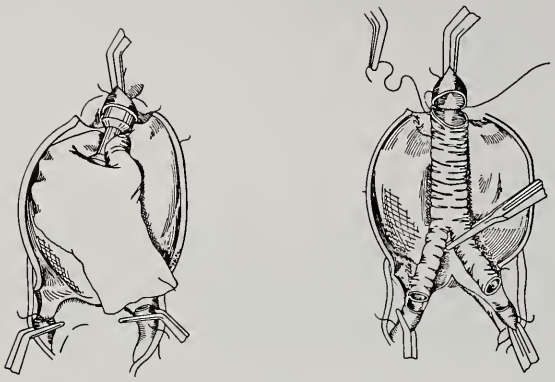


FIGURE 3. Intra-vascular graft sizers measuring the diameter and cross section of the aorta.

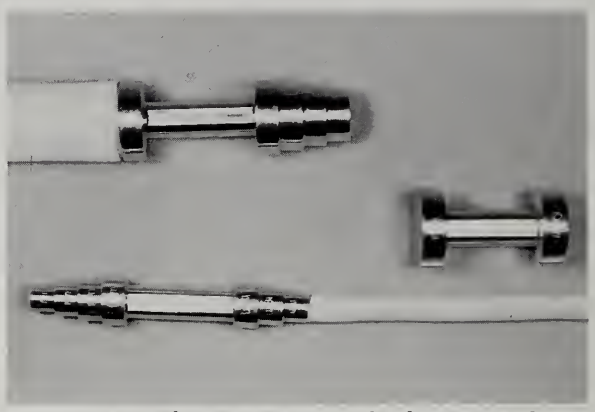


FIGURE 4. Graft sizer measuring the diameter and cross section of graft.

size of the proximal end. However, graft size and selection will be dependent upon age, sex and other factors, i.e. aorto-iliac, femoral occlusive disease.

Cooley[1] noted that in patients with aorto-iliac occlusive disease, vessel size correlation was related to the cross sectional area of the lumen rather than the diameter of the proximal and distal vessels undergoing reconstruction. The bifurcation graft should be half of the area of the proximal aorta.

In patients with aortic occlusive disease, the graft size should be 10mm x 6mm, 12mm x 7mm, 14mm x 8mm because in patients with small abdominal aortas, the distal limb of 6mm provides optimum flow and reduces the incidence of thrombosis.

The dumbbell devices are constructed from aluminum since this is a light metal, easy to handle, and presents no problem in sterilization. These can be steam sterilized within three minutes and used for the next case.

SUMMARY

Intravascular graft sizers are simple to use and require only conventional steam sterilization. Use of these sizers removes the guessing from determination of graft size and refines the technique of arterial and venous reconstruction. They are not disposable and may be used repeatedly. From a cost containment perspective, they are relatively inexpensive.

Intravascular graft sizers are dumbbell shaped devices with cylindrical cone shaped, graduated segments made of aluminum, stainless steel or plastic. They measure 6mm to 21mm and the limbs of the sizers may be slightly curved in order for easy introduction into the iliac or femoral vessels. They are chiefly indicated in arterial reconstruction following resection of aortic aneurysms.

After resection of the diseased aorta, the graduated cylindrical sizers are easily introduced into the proximal aorta and distal outflow tract, thus measuring the diameter and cross section of the vessels, thereby providing the proper size graft for reconstruction.

Graft size and selection will be dependent on age, sex, and other factors, i.e. aorto-iliac, femoral occlusive disease.

Previously, the surgeon has relied on macroscopic examination and calipers to determine the size graft to select. Calipers measure only diameter and do not provide reliable cross section dimensions of the aorta. □

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Instruments can be obtained from Walter Lounz Surgical, Inc., P.O. Box 26426, Jacksonville, FL 32218.

ECONOMICS OF NEONATAL BACK TRANSPORT IN SOUTH CAROLINA

W. B. PITTARD, III, M.D.*

A modern procedure to avoid overcrowding in tertiary care nurseries is neonatal back transport to level I and II nurseries within their catchment area. This procedure of transferring neonates to community hospitals near their home when they no longer need tertiary support but are not yet ready for home care has been shown to increase efficiency of tertiary bed utilization, to increase neonatal care participation by primary physicians and to reduce the cost of neonatal health care.[1-3] With increasing statewide concern over the rising cost of health care in neonatal intensive care units, an analysis of cost savings related to back transport was undertaken at the Medical University of South Carolina (MUSC). This review indicates that an average dollar savings of $2,998 per back transported neonate can be anticipated from this procedure. The total savings could be increased further by increasing the number of back transports. We discuss methods to facilitate this increase in the number of neonates back transported and the safety of the procedure.

MATERIALS AND METHODS

A follow-up evaluation of all back transported neonates at MUSC between January 1 and June 30, 1985 was conducted. This was accomplished by first identifying, via computer print out, all neonates admitted during this period. Information recorded included whether or not each infant was eligible for back transport and if so, if it occurred. Neonatal eligibility for back transport at MUSC requires (1) no need for supplemental oxygen and/or intravenous support, (2) a consistent weight gain on oral feeds and (3) no treatment with parenteral medications.

Additional information concerning each neonate was obtained by telephone communication with the primary care physician. This included: (1) any medical complication(s) encountered after back transport and prior to hospital discharge and (2) length of hospitalization at the receiving hospital. Finally, per diem hospital charges were obtained for intermediate care from hospital administration at MUSC and from the American Health Association Survey for hospitals in South Carolina.[4]

RESULTS

During the six-month period, January through June, 1985, 356 neonates were admitted to the MUSC intensive care nursery. Of this number, 103 were born in an outside hospital and transferred to MUSC, while 253 were inborn. Of the total neonatal admissions (n=356), 27 died (21 inborn and six outborn) and were thus not eligible for back transport. Similarly, of the 232 inborn surviving babies, 106 had no financial support and were therefore ineligible for back transport. A total of 223 infants (97 outborn and 126 inborn) were eligible for back transport or transport from MUSC to a community hospital closer to their home for a portion of their convalescent care. Of this group, 63 infants (10 term and 53 premature) or 28 percent of those eligible were back transported from MUSC to level I (n=37), level II (n=20) or level III (n=6) nurseries. Of the 53 premature infants, 26 were inborn babies (20 following maternal transport) and 37 were admitted following neonatal transport from outside hospitals.

One neonate was readmitted to MUSC for patent ductus arteriosus (PDA) therapy after back transport to a level I nursery. Physiologic hyperbilirubinemia and apnea were each encountered once in different infants. The remaining 60 infants had no medical complications following reverse transport.

The back transported infants remained hospitalized at their receiving hospitals a total of 592 days or 9.4 days per neonate. This represented a saving for MUSC of 3.3 intermediate care beds at 100 percent occupancy for the entire 180 day period. Since there are 18 intermediate care beds at MUSC, this represents an 18 percent (3.3/18) increase in bed availability.

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The per diem cost differential for intermediate care beds between MUSC and statewide comparable sized hospitals is approximately $318. Thus, a cost of approximately $188,892 (3.3 beds x 180 days x $318/day) was avoided or an average savings in 1985 dollars of $2,998 per neonate resulted from the process of back transport.

DISCUSSION

The Medical University of South Carolina is one of the five designated tertiary care nurseries in the state and is the state referral center for neonates with complex congenital heart disease. Further, it receives many of the state's neonates requiring pediatric surgical support. Because of the intricacies involved in the clinical, educational and research services provided at MUSC, the cost of care is greater than at other statewide comparable sized hospitals. Nevertheless, the effect of hospital cost differentials can be minimized by earlier and more efficient utilization of the back transport procedure.

Through more extensive use of back transport, one can assure admission to the maximum number of neonates requiring intensive care. One method of increasing back transports is to increase the level of neonatal care sophistication in receiving hospitals. This has been attempted by many tertiary care nursery facilities by establishing a strong program of outreach education. This increased community hospital nursery capability, however, has been difficult to effect through education of personnel alone since equipment and space are both major factors in the medical support of neonates. Thus, while outreach education has promoted a better understanding of neonatal medical needs, the limitation in the physical facilities of receiving hospitals has served to reduce the ultimate number of back transports accomplished.

Similarly, the number of back transported neonates should be greater in an area where level II hospitals are more common. Increased numbers of Level II hospitals could again facilitate earlier back transport by allowing the transfer of infants requiring more sophisticated medical support. Nevertheless, because the number of hospitals offering level II care is fixed in a given area, this number can not be readily altered. Moreover, this observation partially explains why one tertiary care hospital will not have the same percentage of eligible neonates back transported as another.

The safety of back transport has been previously documented in the literature but it has not been confirmed in South Carolina. In this review, there was one child readmitted for PDA closure which was accomplished with a medical approach. The baby was subsequently discharged in good condition. The hyperbilirubinemia and apnea recognized at receiving hospitals in two separate infants did not result in readmission to MUSC and cleared with minimal therapy at the back transport hospital.

The cost savings both to the patient in dollars and to the tertiary unit in terms of space and personnel has not been previously evaluated in South Carolina. This saving is determined in 1985 dollars and clearly constitutes a significant method of reducing the cost of neonatal care in this state. □

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SCMA NEWSLETTER

June, 1986

1986 LEADERSHIP CONFERENCE SCHEDULED

The 1986 Leadership Conference has been scheduled for Wednesday, September 17, 1986 at the Sheraton Hotel, I-20 and Bush River Road in Columbia. Included among the invitees are Presidents and Presidents-Elect (or Vice Presidents) of county medical societies, members of the SCMA Board of Trustees, members of the Board of SOCPAC, the Building Corporation, the Medical Care Foundation and SCIMER, members of the SCMA Past Presidents' Club, Auxiliary leaders and county medical society executive secretaries.

An educational and informative program is being planned, with details to be forthcoming. Invitees listed above should mark their calendars now, and official invitations will follow.

Those county medical societies who have not notified the SCMA office of their new officers for 1986 should do so immediately, so invitations can be mailed to the appropriate persons.

1987 ANNUAL MEETING

The 139th Annual Meeting of the South Carolina Medical Association will be held April 28 - May 2 in Charleston.

Convention headquarters will be the new Charleston Place, an Omni Hotel, at 130 Market Street in the heart of Charleston's historic district. It houses 500 guest rooms including 46 suites, and the multi-use complex will contain over 40 specialty shops.

The Charleston Place is scheduled for completion in early 1987. Plan to attend the 1987 Annual Meeting and be one of the first groups to enjoy this new facility.

INDIGENT CLINIC GUIDELINES

The SCMA Committee on Primary Care/Medicaid and Indigent Care, under the Chairmanship of *Benjamin E. Nicholson, M. D.*, has developed guidelines for the establishment of clinics for health care of the medically indigent. These guidelines are intended for use statewide in areas where a need for delivery of care to people who cannot obtain it elsewhere is identified.

The SCMA Board of Trustees has subsequently endorsed the guidelines, and they are on file at SCMA Headquarters. If a need exists for such a clinic in your area and you are considering the establishment of an indigent clinic, please notify SCMA for a copy of the guidelines and any other information which may be available.

GROWING, GROWING, GROWING...

SCMA membership has continued to grow by approximately seven percent since last year, as demonstrated by the following table:

	May 13, 1986	May 14, 1985
Active	2,479	2,345
New Members	35	16
Honorary	228	206
Total	2,742	2,567

The following county medical societies are to be commended on their membership achievements: *Allendale, Chester, Hampton, Spartanburg and Union.* These county societies range from 79 percent to 100 percent membership in the SCMA.

The SCMA will be mailing a list of non-SCMA members to county society Presidents and Medical District Trustees in the near future, along with a request for assistance in recruiting members on a one-to-one basis.

CAPSULES....

Honorary membership status has been granted to *Leroy Webb, M. D., Easley; Charles R. Green, M. D., Aiken; William C. Herbert, Jr., M. D., Spartanburg; and Herman Singletary, M. D., Columbia.* Affiliate memberships in the SCMA, recently approved by the Board of Trustees, include *J. Wesley Edel, M. D., Orangeburg; and Jay P. Roller, M. D., Hilton Head.*

J. Lorin Mason, M. D., has been appointed by the Board of Trustees to the MUSC Admissions Committee replacing *Hunter Stokes, M. D.,* who recently resigned.

Donald G. Kilgore, Jr., M. D., John C. Hawk, III, M. D., and John Simmons, M. D., were recently appointed to a South Carolina Hospital Association Task Force organized to study the Medicare Intermediary At Risk Contract.

The SCMA was asked for assistance by the Health and Human Services Finance Commission in evaluating "Program Integrity," because of the large number of complaints from physicians regarding this program. The SCMA Board of Trustees has appointed *William Turner, M. D.,* to assist in this evaluation.

Benjamin E. Nicholson, M. D., will act as one SCMA representative on a committee of the S. C. Appalachian Health Council which will study the private practice of primary care in the counties comprising HSA I. An additional SCMA appointment is still pending.

JULY JOURNAL TOPIC

The July, 1986 issue of *The Journal of the South Carolina Medical Association* will contain articles discussing special issues in long term care. This symposium issue, organized by the S. C. Federation of Older Americans, is being partially funded by the S. C. Department of Social Services, and will address alternative programs for the delivery of long term community care for the elderly.

TORT REFORM EFFORTS CONTINUE - COALITION FORMED

The South Carolina Medical Association has joined the South Carolina Civil Justice Coalition and will be represented on the Coalition Steering Committee by Executive Vice President, *William F. Mahon.*

Other members in the Coalition at the present time, and their Steering Committee representatives include:

Mrs. Virginia S. Wolfe	*Assistant Vice President, Business and Government Relations, S. C. Chamber of Commerce*
Mr. John N. McMillan	*S. C. Highway Heavy Manager, Associated General Contractors of America, Inc.*
Mr. J. Richards Todd	*Assistant to the Executive Vice President, S. C. Trucking Association, Inc.*
Mr. James M. Hatchell	*President, S. C. Merchants Association*
Edward E. Poliakoff, Esq.	*S. C. Chapter of American Institute of Architects*
Mr. John A. Thompson	*Executive Director, Independent Insurance Agents of America*
Carl B. Epps, III, Esq.	*Legislative Chairman, S. C. Defense Trial Lawyers Association*

The Coalition is endorsing and supporting tort reform legislation in the General Assembly proposed by Senators *John E. Courson* (District 20, Richland County) and *William W. Doar, Jr.* (District 34, Georgetown and Horry Counties). The proposed Bill contains all provisions of the SCMA Tort Reform Bill introduced this year with the exception of setting forth a sliding scale of payments to attorneys based on the amount of the award. However, additional provisions are included, among which is a definition of joint and several liability. Additional details will be forthcoming to the SCMA membership.

COMPETITIVE HEALTH PLAN FOR MEDICARE BENEFICIARIES

Blue Cross and Blue Shield of South Carolina has announced that it will offer a "Complete 65 Plan" as an alternative to traditional Medicare coverage for South Carolina beneficiaries in the Charleston, Columbia and Greenville areas beginning this month. The plan is expected to be statewide by the end of the year.

According to Blue Cross and Blue Shield spokesmen, the "Complete 65 Plan" will offer additional benefits, such as routine physical examinations and private duty nursing, through a Preferred Provider Organization (PPO) of physicians and hospitals.

** OTHER NEWS **

AMERICAN SOCIETY OF HANDICAPPED PHYSICIANS

Are you a physician or medical student with a physical disability/handicap? If so, the American Society of Handicapped Physicians is seeking your participation in advocacy, support, conference, rehabilitation, newsletter, education and employment.

For information contact *The American Society of Handicapped Physicians, 137 Main Street, Grambling, Louisiana 71245, or call (318) 247-3744.*

SURPLUS MEDICAL BOOKS NEEDED

Following a trip to China in 1979 where he visited hospitals, medical institutions and met with Chinese doctors, Jordan M. Phillips, M. D., a retired physician, has created at his own expense a non-profit corporation, "Medical Books for China."

While in China he learned that during the reign of the Red Guards, they went on a rampage to stamp out all western culture. Their activities included destroying libraries and burning all medical books. During the past seven years, Dr. Phillips and his wife have made 25 trips to China and have arranged for some 700,000 medical books and journals as well as audio tapes, film and slide lectures to be sent to the Chinese doctors, and the Chinese government has established a distribution committee headed by the Health Bureau and the Medical School at Tianjim. The committee is charged with the responsibility of overseeing fair distribution of the medical/ educational materials.

Dr. Phillips is appealing for additional support from the United States medical community for more books, journals and teaching materials. Medical books should not be older than 1960 and journals no older than 1969. Donations are 100 percent tax deductible at current market value.

South Carolina physicians wishing to contribute should note the shipping address as follows: *"Medical Books for China," c/o Dr. Jordan M. Phillips, 13021 East Florence Avenue, Santa Fe Springs, California 90670.*

NEW DEA REQUIREMENT

In October of 1985, the Drug Enforcement Administration published a final rule amending the recordkeeping requirements for physicians who prescribe, administer and dispense controlled substances. It has come to our attention that many physicians are unaware of the final rule which implements the changes enacted by Congress in 1984 in the Diversion Control Amendments.

The final rule requires physicians to maintain records for all controlled substances which are dispensed. The rule continues to exempt physicians from record-keeping requirements for the prescribing and occasional administration of controli substances. However, records are required to be kept for the administration of controlled substances by individual practitioners who regularly administer or dispense controlled substances and charge their patients for these substances.

The rule reflects Congressional intent to strengthen the authority of the DEA in preventing the diversion of controlled substances and to tighten the "closed" system of distribution for controlled substances.

MEDICAL ETHICS AND "REVERENCE FOR LIFE"

C. D. BESSINGER, JR., M.D.*

The variety of medical ethical concerns under discussion today, and the complexity of each issue, are but reflections of the profound changes taking place in civilization at large. Extraordinary growth in scientific information and technology, scarcity of resources, economic diversity, and ethnologic and philosophic heterogeneity all challenge ethical thought. The same factors also make it difficult to achieve a consensus on a governing principle that can be the basis for ethical problem solving.

A review of recent articles in the medical ethics literature illustrates that authors appeal to a variety of ethical principles in seeking to analyze complex medical care issues. Among these are "primum non nocere," appeals to sense of professional responsibility or to a specific professional oath, to "laws of humanity," to societal covenant, to the "boundary of the human," to a "community of values," and to "quality of life," as well as appeals to a principle of utilitarianism or situational relativism.

The likelihood of arriving at a satisfactory answer to any ethical question arising in medical practice is considerably reduced when discussants differ widely as to which "principles" are operative in the given situation. Thus it is appropriate to attempt to define a fundamental principle, devoid of cultural and religious bias, which could be widely accepted as the rational basis for ethical problem-solving. To that end, Dr. Albert Schweitzer's philosophy of reverence for life is re-examined in the light of some of today's general medical ethical problems.

REVERENCE FOR LIFE

"Reverence for life" was set forth by Dr. Albert Schweitzer (1875-1965) in *Civilization and Ethics*, volume two of his *Philosophy of Civilization* (1923). Schweitzer saw all life as impelled by "will-to-live." Whether conscious or not, all life shares an inner imperative, a metabolic, healing, homeostatic struggle to reproduce, to survive, to prevail. "Will-to-live" in this context is distinguishable from a conscious will (desire) to live: successful suicide requires that the traumatic insult be sufficient to overcome life's innate will-to-live.

Despite the claim, "I think, therefore I am," thought does not define existence. To Schweitzer, elemental consciousness of existence, of this will-to-live, is the prerequisite of thought. Ethical thought derives from a consciousness of one's own existence in relation to the existence of others.

> True philosophy must start from the most immediate and comprehensive fact of consciousness, which says: 'I am life which wills to live, in the midst of life which wills to live.' . . . Ethics consist, therefore, in my experiencing the compulsion to show to all will-to-live the same reverence as I do to my own. There we have given us that basic principle of the moral which is a necessity of thought. It is good to maintain and to encourage life; it is bad to destroy life or to obstruct it.[1]

It is not possible to derive ethics from thought alone. Such attempts result in ever more complex rules governing ever more minute phenomena. The world of knowledge and experience is so vast that one becomes overwhelmed before being able to comprehend a meaning for the whole. Ethics must begin from an intuitive awareness of the interdependence of all life. We are obliged to live at the cost of other life, and thus experience other life in our own.

Yet ethics may not be realized without thought. From the tension between awareness of existence and thought comes the concept that it is good, not simply to preserve and to promote life, but also "to raise to its highest value life which is capable of development."[2] From awareness of will-to-live arises the widest possible ground of understanding of ethics.

PHYSICIAN-PATIENT RELATIONSHIP

As an individual affirmation engendering respect for all other individuals, reverence for life influences all relationships. It respects patient au-

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tonomy, which is the basis of insistence on fully informed consent, and enriches the concept of the "patient as a person."

It evokes the ideal of service: "A man is truly ethical only when he obeys the compulsion to help all life which he is able to assist, and shrinks from injuring anything that lives."[3] Thus the ethics of reverence for life provide a basis for the claims of professional duty set forth in various medical oaths. In reverence for life, "primum non nocere" finds not only its ethical basis, but also its positive corollary.

THE DYING PATIENT

In its affirmation of individual responsibility for ethical decisions, and in its respect for the autonomy of others, reverence for life acknowledges the prerogative of patients to withdraw from treatment at any time, or to "withdraw" prospectively through a clearly stated "Living Will." Reverence for life treats all persons with dignity. It finds dignity, not in the coming death, but in the remaining life. Its sensitivity is reflected in the physician's report of Dr. Schweitzer's own terminal care at Lambarene:

> Because of evident irreversibility of his condition — deepening cerebral coma, increasing uremia and developing pneumonitis — no further diagnostic measures or specific therapeutic measures were carried out. He continued to receive constant and excellent nursing care, but he did not require any analgesic medications, for at no time was there any evidence of suffering.[4]

THE UNBORN

The recent development of fetal surgery is not foreseen in Dr. Schweitzer's writings. Yet his general affirmation that "ethics are responsibility without limit towards all that lives"[5] would extend ethical concerns to the fetal patient. Such concerns are not limited by considerations of fetal age.

Nor does Dr. Schweitzer write specifically of abortion. In his general writings we find clear acknowledgment that in the chain of survival of all life, life takes life, and that of necessity some choices must be made. Yet:

> The ethics of reverence for life know nothing of a relative ethic. . . . (they) compel (man) to decide for himself in each case how far he can remain ethical and how far he must submit himself to the necessity for destruction of and injury to life, and therewith incur guilt.[6]

Choices must always be individualized. The ethical tension must be resolved in each case and the ethical responsibility may not be displaced to others.

> In ethical conflicts man can arrive only at subjective decisions. No one can decide for him at what point, on each occasion, lies the extreme limit of possibility for his persistence in the preservation and furtherance of life. He alone has to judge this issue, by letting himself be guided by a feeling of the highest possible responsibility towards other life.[6]

SCARCE RESOURCES

As costs have rapidly increased, health care planners and practitioners in the developed nations are now, as their Third World counterparts have always been, faced with ethical questions arising from limits in health care resources. Economist Lester Thurow recently pointed to the ethical burden now forced upon individual practitioners who must choose between a practice style which will use any treatment (even an experimental one) which does no harm, and practice which will use a treatment only when one is "sure that it will make a noticeable improvement."[7] Dr. Schweitzer's experience in Africa seems to advance much the same argument.

Dr. Schweitzer was criticized for his seeming slowness to adopt new treatments and new technology at his hospital in equatorial Africa. Yet he seems to have been quick to adopt new treatments that were clearly beneficial and could be administered with minimal toxicity in the primitive environment of his practice. He was slow to electrify the Lambarene hospital, fearing inordinate dependence on the difficult and uncertain chain of fuel supply.[8] His concerns foreshadowed the later literature on "appropriate technology" in the developing world.[9]

CORPORATE DECISION-MAKING

In matters of corporate or social policy, such as allotting the use of scarce medical resources and administering systems of health care, ethical responsibility still evolves on decision-makers individually. Holding "supra-personal responsibility" (as in management) does not relieve personal responsibility to act ethically:

> I am not at liberty to think, that in the conflict between personal and supra-personal responsibility I can balance the ethical and the expedient to make a relative ethical, or even annul the ethical with the purposive; I must choose between the two.[10]

Reverence for life argues that the corporate decision-maker (the manager of health care resources) must also act so as to "obey the compulsion to help all life which he is able to assist."[3]

MEDICAL EXPERIMENTATION

Dr. Schweitzer clearly recognized the necessity for medical experimentation for the benefit of mankind. All of the arguments advanced above bear in some measure on the question of experimentation, whether on humans or animals. Dr. Schweitzer wrote specifically about animal experimentation:

> Those who experiment with operations or the use of drugs upon animals, or inoculate them with diseases, so as to be able to bring help to mankind with the results gained, must never quiet any misgivings they feel with the general reflection that their cruel proceedings aim at a valuable result. They must first have considered in each individual case whether there is a real necessity to force upon any animal this sacrifice for the sake of mankind. And they must take the most anxious care to mitigate as much as possible the pain inflicted.[11]

DISCUSSION

Reverence for life is not a creed. Reverence ("Ehrfurcht") implies awe, wonder, and respect rather than worship. It provides a basis for a mystical sense of oneness with all life, but it accepts life as it finds it, without intruding on the question of the meaning of life. It conflicts with no religion. Its insights enrich them all, and provide a basis for broader understanding among peoples of different religion.

It is not a code. Schweitzer refused to define rules or values for individual lives, stressing instead individual responsibility and individual decision-making.[12] "To become ethical means to begin to think sincerely."[13] Reverence for life is the basis for individual thinking rather than rule-making.

It is not a cause, and does not give rise to any particular political agenda. Reverence for life is not argued in terms of personal "right," and does not appeal to enforcement. Nor is it argued in terms of mere sentiment. Its ethics appeal to a strong sense of personal responsibility, and requires rigorous individual analysis of all factors bearing on a life-question.

Illumination of ethical problems by the lamp of reverence for life does not automatically provide universal or even predictable answers to problems in patient care. It does, however, establish the ethical milieu in which appropriate questions are raised. It sets the tone of discussion, respecting the life that is the subject of discussion, and the lives and views of all lives affected. It provides the principle against which proposed solutions can be tested.

Physician-patient interaction is a dynamic "quantum field" in which action is not governed by ethical insight alone. A clinical "uncertainty principle" dictates that one may not be able to satisfactorily isolate a particular ethical rule in the complex field of economic, legal, scientific, and technologic forces competing in the shaping of any action. Reverence for life does not yield a generalized protocol for care. Reverence for life must be viewed as the field itself, in which clinical decisions are always formed in an attitude of "sincere thought."

It is now 62 years since the publication of the *Philosophy of Civilization*, and 20 years after its author's death. There have been many changes in society and in medical technology and practice. Yet as this study suggests, the ethics of reverence for life are pertinent to a broad range of current medical ethics issues, and deserve continued study and application.

SUMMARY

Review of a number of articles dealing with issues in medical ethics reveals a lack of consensus regarding a governing ethical principle. Examination of several current ethical issues in the light of Dr. Albert Schweitzer's "reverence for life" suggests its wide applicability as an ethic to which questions may be referred, and against which proposed solutions may be tested. □

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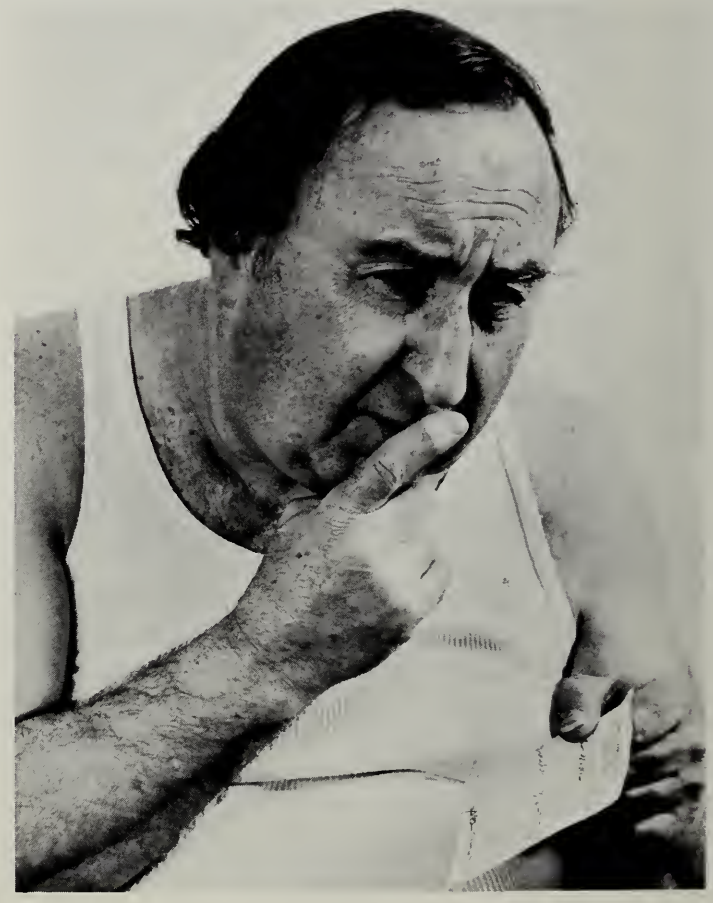
How well are you communicating with your PATIENTS?

Patient compliance—how well patients follow instructions about taking prescription drugs—is something that worries health professionals, according to a recent Harris survey. And with good reason. A number of studies have shown that a third to a half of all drugs are taken improperly. Yet a Chilton survey found that only 2 to 4 percent of patients question their doctors about drugs prescribed for them.

It's up to health-care providers to open up the dialogue about prescription drugs. When you write, dispense or check on a prescription, make sure your patient knows:

- **The name** of the drug
- **Its purpose**—what conditions does it treat?
- **How and when** to take the drug—and when to stop taking it
- What **food, drinks and other drugs to avoid** while taking it
- What **side effects** may result—are they serious, short-term, long-term, etc.?

■ *A message from the Food and Drug Administration.*



Before prescribing, see complete prescribing information in SK&F CO. literature or *PDR*. The following is a brief summary.

* **WARNING**

This drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual. If this combination represents the dosage so determined, its use may be more convenient in patient management. Treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

Contraindications: Concomitant use with other potassium-sparing agents such as spironolactone or amiloride. Further use in anuria, progressive renal or hepatic dysfunction, hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs.

Warnings: Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired. If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with cardiac irregularities. It is more likely in the severely ill, with urine volume less than one liter/day, the elderly and diabetics with suspected or confirmed renal insufficiency. Periodically, serum K^+ levels should be determined. If hyperkalemia develops, substitute a thiazide alone, restrict K^+ intake. **Associated widened QRS complex or arrhythmia requires prompt additional therapy.** Thiazides cross the placental barrier and appear in cord blood. Use in pregnancy requires weighing anticipated benefits against possible hazards, including fetal or neonatal jaundice, thrombocytopenia, other adverse reactions seen in adults. Thiazides appear and triamterene may appear in breast milk. If their use is essential, the patient should stop nursing. Adequate information on use in children is not available. Sensitivity reactions may occur in patients with or without a history of allergy or bronchial asthma. Possible exacerbation or activation of systemic lupus erythematosus has been reported with thiazide diuretics.

Precautions: The bioavailability of the hydrochlorothiazide component of 'Dyazide' is about 50% of the bioavailability of the single entity. Theoretically, a patient transferred from the single entities of triamterene and hydrochlorothiazide may show an increase in blood pressure or fluid retention. Similarly, it is also possible that the lesser hydrochlorothiazide bioavailability could lead to increased serum potassium levels. However, extensive clinical experience with 'Dyazide' suggests that these conditions have not been commonly observed in clinical practice. Angiotensin-converting enzyme (ACE) inhibitors can elevate serum potassium; use with caution with 'Dyazide'. Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids, and during concurrent use with amphotericin B or corticosteroids or corticotropin [ACTH]). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Cumulative effects of the drug may develop in patients with impaired renal function. Thiazides should be used with caution in patients with impaired hepatic function. They can precipitate coma in patients with severe liver disease. Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia, thrombocytopenia, agranulocytosis, and aplastic and hemolytic anemia have been reported with thiazides. Thiazides may cause manifestation of latent diabetes mellitus. The effects of oral anticoagulants may be decreased when used concurrently with hydrochlorothiazide; dosage adjustments may be necessary. Clinically insignificant reductions in arterial responsiveness to norepinephrine have been reported. Thiazides have also been shown to increase the paralyzing effect of nondepolarizing muscle relaxants such as tubocurarine. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effects may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. Triamterene has been found in renal stones in association with the other usual calculus components. Therefore, 'Dyazide' should be used with caution in patients with histories of stone formation. A few occurrences of acute renal failure have been reported in patients on 'Dyazide' when treated with indomethacin. Therefore, caution is advised in administering nonsteroidal anti-inflammatory agents with 'Dyazide'. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine. Hypokalemia is uncommon with 'Dyazide', but should it develop, corrective measures should be taken such as potassium supplementation or increased dietary intake of potassium-rich foods. Corrective measures should be instituted cautiously and serum potassium levels determined. Discontinue corrective measures and 'Dyazide' should laboratory values reveal elevated serum potassium. Chloride deficit may occur as well as dilutional hyponatremia. Concurrent use with chlorpropamide may increase the risk of severe hyponatremia. Serum PBI levels may decrease without signs of thyroid disturbance. Calcium excretion is decreased by thiazides. 'Dyazide' should be withdrawn before conducting tests for parathyroid function. Thiazides may add to or potentiate the action of other antihypertensive drugs. Diuretics reduce renal clearance of lithium and increase the risk of lithium toxicity.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances; postural hypotension (may be aggravated by alcohol, barbiturates, or narcotics). Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and respiratory distress including pneumonitis and pulmonary edema, transient blurred vision, sialadenitis, and vertigo have occurred with thiazides alone. Triamterene has been found in renal stones in association with other usual calculus components. Rare incidents of acute interstitial nephritis have been reported. Impotence has been reported in a few patients on 'Dyazide', although a causal relationship has not been established.

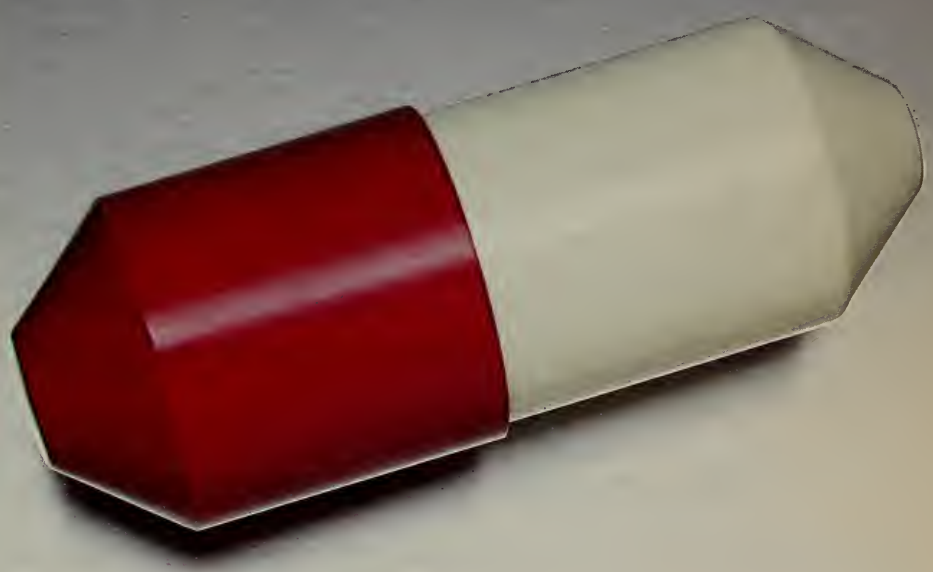
Supplied: 'Dyazide' is supplied as a red and white capsule, in bottles of 1000 capsules; Single Unit Packages (unit-dose) of 100 (intended for institutional use only); in Patient-Pak™ unit-of-use bottles of 100.

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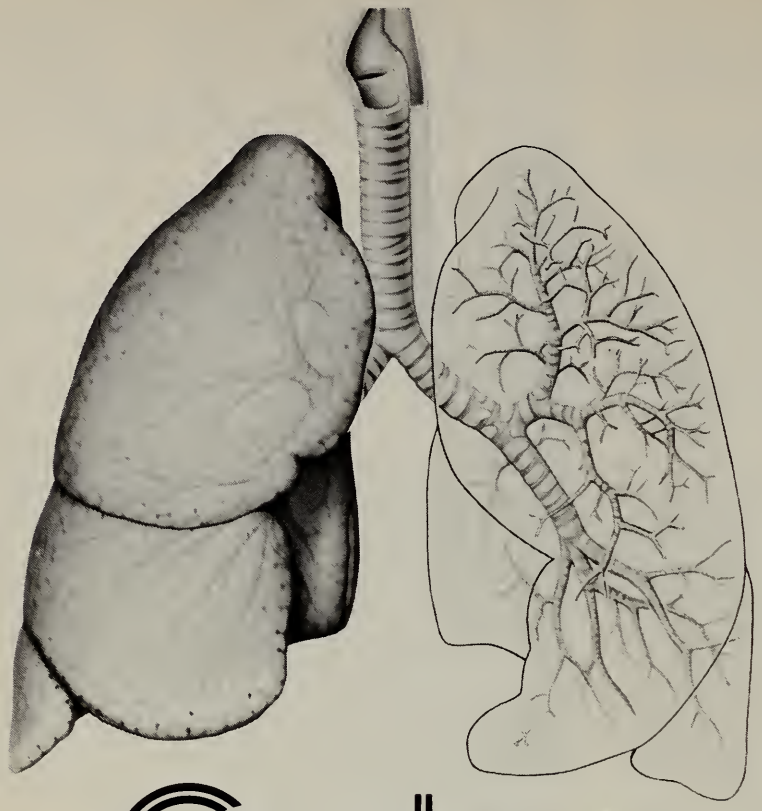
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cefaclor

250-mg Pulvules® t.i.d. offers effectiveness against the major causes of bacterial bronchitis

Haemophilus influenzae, H influenzae, Streptococcus pneumoniae, Streptococcus pyogenes
(ampicillin-susceptible) (ampicillin-resistant)

Note: Ceclor® is contraindicated in patients with known allergy to the cephalosporins and should be given cautiously to penicillin-allergic patients.

Penicillin is the usual drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever. See prescribing information.

Ceclor® (cefaclor)

Summary. Consult the package literature for prescribing information.

Indications: Lower respiratory infections, including pneumonia, caused by susceptible strains of *Streptococcus pneumoniae, Haemophilus influenzae,* and *S. pyogenes* (group A beta-hemolytic streptococci).

Contraindications: Known allergy to cephalosporins.

Warnings: CECLOR SHOULD BE ADMINISTERED CAUTIOUSLY TO PENICILLIN-SENSITIVE PATIENTS. PENICILLINS AND CEPHALOSPORINS SHOW PARTIAL CROSS-ALLERGENICITY. POSSIBLE REACTIONS INCLUDE ANAPHYLAXIS.

Administer cautiously to allergic patients.

Pseudomembranous colitis has been reported with virtually all broad-spectrum antibiotics. It must be considered in differential diagnosis of antibiotic-associated diarrhea. Colon flora is altered by broad-spectrum antibiotic treatment, possibly resulting in antibiotic-associated colitis.

Precautions:

- Discontinue Ceclor in the event of allergic reactions to it.
- Prolonged use may result in overgrowth of nonsusceptible organisms.
- Positive direct Coombs' tests have been reported during treatment with cephalosporins.
- In renal impairment, safe dosage of Ceclor may be lower than that usually recommended. Ceclor should be administered with caution in such patients.
- Broad-spectrum antibiotics should be prescribed with caution in individuals with a history of gastrointestinal disease, particularly colitis.
- Safety and effectiveness have not been determined in pregnancy, lactation, and infants less than one month old. Ceclor penetrates mother's milk. Exercise caution in prescribing for these patients.

Adverse Reactions: (percentage of patients)

Therapy-related adverse reactions are uncommon. Those reported include:

- Gastrointestinal (mostly diarrhea): 2.5%.
- Symptoms of pseudomembranous colitis may appear either during or after antibiotic treatment.
- Hypersensitivity reactions (including morbilliform eruptions, pruritus, urticaria, erythema multiforme, serum-sickness-like reactions): 1.5%; usually subside within a few days after cessation of therapy. These reactions have been reported more frequently in children than in adults and have usually occurred during or following a second course of therapy with Ceclor. No serious sequelae have been reported. Antihistamines and corticosteroids appear to enhance resolution of the syndrome.
- Cases of anaphylaxis have been reported, half of which have occurred in patients with a history of penicillin allergy.
- Other: eosinophilia, 2%; genital pruritus or vaginitis, less than 1%.

Abnormalities in laboratory results of uncertain etiology

- Slight elevations in hepatic enzymes.
- Transient fluctuations in leukocyte count (especially in infants and children)
- Abnormal urinalysis; elevations in BUN or serum creatinine
- Positive direct Coombs' test
- False-positive tests for urinary glucose with Benedict's or Fehling's solution and Clinitest® tablets but not with Tes-Tape® (glucose enzymatic test strip, Lilly)

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Editorial

HEALTH CARE'S MORAL QUANDARY

This issue of The Journal *features a thoughtful essay by Dr. C. D. Bessinger of Greenville on medical ethics. Dr. Bessinger suggests that Albert Schweitzer's concept of "reverence for life" might serve as a matrix for considering the many complex issues facing us today. In the following editorial, Professor Nora Bell reviews the current state-of-the-art and suggests that medical ethics will become an increasingly important discipline not only in the medical school curriculum but also in day-to-day clinical practice. Guest editorials reflect the opinions of the authors and do not necessarily reflect the opinions of* The Journal *or the South Carolina Medical Association.*

— CSB

Noted clinical ethicist, Mark Siegler, describes the history of medical decision-making as having evolved from an "Age of Paternalism," dating from Hippocratic times until approximately two decades ago, to an "Age of Autonomy," characterized by an emphasis on patients' rights and the concept of informed consent, to a newly emerging "Age of Bureaucracy" that promises to be concerned with more governmental involvement in the provision of health care, with rationing, and with forced limitation of services. It is against such a backdrop that one must evaluate the ethical challenge for caring.

Several phenomena have been said to account for the increasing complexity of health care's moral dilemmas. At least five are thought to be particularly noteworthy: (1) advances made in medical science and medical technology; (2) the recognition and emergence of the patient as a well-informed consumer who wants to share in the responsibility of deciding his or her own fate; (3) medical malpractice lawsuits and an awareness of an increasing emphasis on the notion of legal accountability; (4) court-ordered treatment or cessation of treatment; and (5) state and federal codes and guidelines regulating aspects of health care delivery.

For example, consider the following:

> Hilda Peter is a sixty-five year old nursing home patient who has been in a "chronic vegetative state" for more than a year. Miss Peter has been kept alive with a nasogastric feeding tube since she suffered a heart attack which left her permanently comatose and severely brain damaged. Her guardian and companion of many years, Eberhard J. Johanning, has requested removal of her feeding tube (finally seeking court authorization to withdraw the tube), urging that Miss Peter had repeatedly requested that she never be "kept alive as a vegetable." Her physicians are aware of *In re Conroy*, a New Jersey case decided in January of 1985, which argued that there is no real difference between feeding tubes and ventilators in decisions involving withdrawal of life-sustaining care. They wonder if they should honor Mr. Johanning's request.

And the following:

> Mrs. Johns is a thirty-seven year old professional, pregnant with her third child and seeking prenatal diagnosis of the pregnancy. Her two other children are both female, and she has had a number of elective terminations. Her advanced maternal age is considered an indication for genetic testing. With chorionic villi sampling (CVS), she can learn the genetic status of the fetus as well as its sex within three days. The genetic counselors wonder whether she is using prenatal diagnosis for selecting the sex of the fetus.

In the not too distant past, Mrs. Johns would not have been able to elect either prenatal genetic screening or non-therapeutic abortion, and Hilda Peter probably would have died shortly after her CVA. Physicians and nurses caring for patients

like Hilda Peter and Mrs. Johns would not have faced the same ethical dilemmas they face today. Procedures like amniocentesis, chorionic villi sampling, and cardiopulmonary bypass surgery, and equipment like ventilators, dialysis machines and cardiac pacemakers were simply not available. Even gastric feeding tubes and the development of nutrients and delivery systems have improved and become more readily available. Today, such procedures and equipment number few among the vast numbers of breathtaking advances in medical science, advances that include new drugs, transplants, implants, lifelike prostheses, and space age diagnostic technology. Increased treatment and diagnostic options have meant an increase in the ethical dilemmas faced by patient and physician alike.

As medical technology has become more sophisticated, so has communications technology, and advances made in the electronic media have given health care increased visibility and have heightened public awareness of medicine's capabilities and vulnerabilities. This, too, has placed an added emphasis on the ethical content of medical decisions.

In addition, the "Age of Autonomy" has forced all parties to any medical decision to question both individual responsibility and institutional responsibility. The move toward more patient participation in health care decisions has focused attention on patients' rights, and has led to a clarification of the duties (both moral and legal) binding members of the health professions. Emphasizing the importance of autonomous choice also has called attention to physicians' rights. Accordingly, the "Age of Autonomy" has sought a reexamination of "Good Samaritan" principles, the principle of benevolence, and the harm principle. It has suggested that one could "harm" another by being authoritarian or paternalistic. It has urged that one consider seriously the notion that competent adults be allowed to make tragic choices. It has also raised questions of loyalty among the various health care professions. Should a nurse inform a patient of alternative therapies not mentioned by the physician? Should a pharmacist refuse to honor a prescription that he or she thinks is being abused?

Inevitably, the moral dialogue has spilled over into the legal arena, long the place where conflicts of rights and duties have been taken for adjudication. And the law has addressed questions such as whether patients' rights have been violated, whether one can be said truly to have exercised autonomous choice, whether autonomous choice has been abridged, and whether members of the various health professions have overstepped their professional boundaries. In an important sense, however, the law has not resolved the ethical dilemmas. Many physicians still wonder whether a seventeen year old Jehovah's Witness ought to be allowed to refuse blood products when such refusal would mean death, and many medical professionals still wonder whether one ought to remove an NG tube from an elderly non-brain dead comatose patient. Many still feel uncomfortable about giving a woman information that would allow her to terminate a pregnancy because she did not care for the sex of the fetus.

Increasingly, courts are stepping in and allowing or disallowing certain medical procedures. In *Roe vs. Wade*, for example, the United States Supreme Court made non-therapeutic abortion a legal option for women. *In re Quinlan* allowed the removal of ventilator support from patients who had "no realistic possibility of returning to any semblance of cognitive or sapient life." And *In re Conroy* allowed that feeding tubes could be removed if it could reasonably be determined that such would have been the patient's own choice, and/or that "life's burdens substantially outweigh its benefits." State legislatures have entered the picture by enacting so-called living will legislation and natural death acts. In March of 1986, South Carolina became the thirty-sixth state to adopt living will legislation. State legislatures, including South Carolina's, have also begun to enact statutes defining death. The Department of Health and Human Services, in their notorious "Baby Doe Regulations," mandated that all handicapped newborns be resuscitated and maintained unless it could be shown that such an infant was clearly "terminal." The list of legal mandates could go on for pages.

In fact, some argue that the law has raised additional ethical dilemmas for physicians. Certainly the fact that the law has forced physicians to ask, "What must I do to avoid a charge of medical malpractice?", suggests a moral dilemma which intrudes into the ideal physician/patient relationship.

All of the factors noted above have profoundly affected the process of medical decision-making. As I argued earlier, the law's forays into the medi-

cal arena have served to give even greater visibility to moral and ethical problems in health care, but the law has not really resolved them. Rather, such forays seem to have ushered in what Dr. Siegler calls the "Age of Bureaucracy" and to have created the moral quandary faced by health care professionals, health care institutions, and the health care system as a whole.

One does not have to look far to realize that considerable confusion lies at the root of the quandary. New Jersey law mandates the use of a newly created state Ombudsman for the Institutionalized Elderly, who must recommend whether Hilda Peter's feeding tube should be removed. In making his decision, the Ombudsman must determine (1) whether such a choice might reasonably have been her choice, (2) whether life's burdens in her case outweigh its benefits, (3) whether she can be expected to die within a year (a rather arbitrary legal criterion dictated by *In re Conroy*), and (4) which one of the three criteria ought to take priority over the others. He recommended against removing Miss Peter's feeding tube because he felt that the law required him to do so. Her overall physical/medical condition is such that she *cannot* be expected to die within a year. Affirming that she might live for years in her current state, and that he believed that she would not have wanted to continue life in this way, the Ombudsman urged the New Jersey courts and legislature to establish more "flexible" guidelines to use in such cases.

I predict that medical ethics, the study of clinical ethics, will take on added importance in medical schools and hospitals, primarily because physicians and nurses feel the lack of a clear-cut moral standard to use as a guide. Many of them feel that the intrusion of the law and legislated guidelines have eroded rather then enhanced *moral* accountability and replaced it with rigid, seemingly inflexible, guidelines that make one practice "defensive medicine."

The "Age of Bureaucracy" has moved medicine away from personalized medical care and has created what some believe is too structured an approach to what has traditionally been a caring, clinical approach to patient care based on a respect for each individual patient's life. Current trends put medicine in a difficult moral bind: Can one avoid compromising traditional humanistic goals in the face of burgeoning legal rights and requirements?

Nora K. Bell, Ph.D.
Department of Philosophy
University of South Carolina
Columbia, S. C. 29208

REFERENCES

1. Barry, Vincent. *Moral Aspects of Health Care.* Belmont, CA: Wadsworth Publishing Co., 1982. 2-16.
2. *In re Conroy,* 188 N.Y. Sup. 523 (1983); N.J. Super. Ct., App. Div. A-2483-82 T1 (1983); N.J. Sup. Ct., A-108 (1985).
3. *In re Quinlan,* 384 A 2d 801 (Ch. Div. 1975), rev'd 355 A 2d 647 (N.J. 1976).
4. Nevins, Michael. "New Jersey's 'Right-to-die' Cases: A View From the Ring." *American College of Physicians Observer,* March, 1986. 13-16.
5. *Roe v. Wade,* 410 U.S. 113, 93 S. Ct. 705 (1973).

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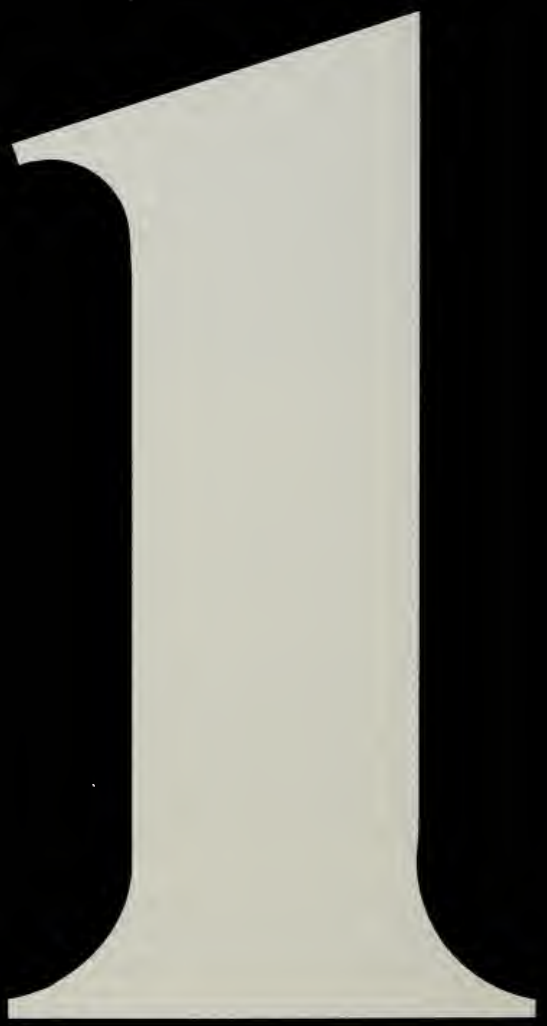
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SEPTEMBER

"SCIMER'S FOURTH ANNUAL REVIEW AND UPDATE IN MEDICINE"

DATES: Monday, September 22 - Monday, September 29, 1986
LOCATION: Mariner's Inn on Hilton Head Island, South Carolina
DESCRIPTION: The Fourth Annual Review and Update in Medicine is offering a multi-disciplinary program emphasizing primary care. This important conference will give participants an opportunity to acquire essential practice skills in carefully planned scientific sessions.
SPONSOR: South Carolina Institute for Medical Education and Research (SCIMER) of the South Carolina Medical Association
AUDIENCE: M.D.'s
FACULTY: Guest Lecturers
CREDIT: 26 hours, AMA Category I, CME Credit.* AAFP Prescribed for.
FEE: $400
CONTACT: James Long, M.D. (803) 591-6280

*The South Carolina Medical Association is accredited by the ACCME to offer programs in Continuing Medical Education that meet the requirements for Category I of the AMA Physician's Recognition Award.

JULY

THURSDAY-SATURDAY JULY 10-12
KIAWAH ISLAND, Kiawah Island Inn
"Clinical Obstetrics"
SPONSOR: Medical College of Georgia
DESCRIPTION: New and pertinent information regarding maternal and fetal management in complicated pregnancies.
AUDIENCE: Family Physicians in OB Obstetricians and Gynecologists
CONTACT: Glen E. Garrison, M.D., (404) 828-3998
CME CREDIT: 16 Hours AAFP Prescribed

WEDNESDAY-SUNDAY JULY 23-27
KIAWAH ISLAND, East Beach Conference Center
"Critical Care Medicine"
SPONSOR: Medical College of Georgia
AUDIENCE: Primary Care Physicians
CONTACT: Glen E. Garrison, M.D., (404) 828-3998
CME CREDITS: 30 Hours AAFP Prescribed

FRIDAY-SATURDAY JULY 25-26
HILTON HEAD, Hilton Head Inn (Sea Pines)
"Arrhythmias: Interpretation, Diagnosis and Management"
SPONSOR: Medical Education Resources, Littleton, CO
AUDIENCE: M.D.'s
CONTACT: Medical Education Resources, Toll free 1-800-421-3756
FEE: $295
CME CREDIT: 11 Hours AMA Category I, 11 Hours AAFP Prescribed

AUGUST

MONDAY-FRIDAY AUGUST 4-8
MYRTLE BEACH, Beach Cove Inn
"Fourteenth Annual Beach Workshop"
SPONSOR: Bowman Gray School of Medicine
DESCRIPTION: Update on topics in internal medicine presented by the faculty of five medical schools
AUDIENCE: Primary Care Physicians
CONTACT: Emery C. Miller, M.D., (919) 748-4274
CME CREDIT: 20 hours AAFP Prescribed

THURSDAY-SUNDAY AUGUST 7-10
HILTON HEAD ISLAND, Mariner's Inn
"Cardiology for the Pediatrician"
SPONSOR: South Carolina Chapter, American Academy of Pediatrics
DESCRIPTION: Annual Scientific Session
AUDIENCE: Pediatricians
FACULTY: Dan G. McNamara, M.D., Paul R. Lurie, M.D., Paul C. Gillette, M.D.
CONTACT: Debbie Shealy, (803) 798-6207
CME CREDIT: AMA Category I and PREP Applied For

SEPTEMBER

THURSDAY-SUNDAY SEPTEMBER 4-7
KIAWAH ISLAND, Kiawah Island Inn
"Pulmonary Disease Review"
SPONSOR: Medical College of Georgia
AUDIENCE: Primary Care Physicians
CONTACT: A.S. Elguindi, M.D., William Speir, (404) 828-3967
CME CREDIT: 22½ Hours AAFP Prescribed

FRIDAY-SATURDAY SEPTEMBER 12-13
SPARTANBURG
"South Carolina Chapter Meeting American College of Surgeons"
SPONSOR: SC Chapter ACS and Spartanburg General Hospital
DESCRIPTION: This day and one-half program features lectures for surgeons in gastrointestinal and cardiovascular surgery, as well as infectious diseases.
AUDIENCE: Surgeons
CONTACT: Colleen Miller, (803) 591-6280
FEE: $125.00
FACULTY: Drs. Basil Pruitt, Robert Zeppa, John Carson, Scott Jones, Ronald Nichols and Joe Utley
CME CREDIT: 10 Hours AMA Category I

GRAND ROUNDS
U.S.C. School of Medicine

2nd and 4th WEDNESDAYS 3:00-4:00
GASTROINTESTINAL RADIOLOGY CONFERENCE
COLUMBIA, VA Radiology Dept. Conference IC 209, VA Hospital
SPONSOR: USC School of Medicine, Dept. of Radiology and Gastroenterology and Division of Internal Medicine
DESCRIPTION: One-half of the conference will be a discussion and film review of a specific subject. The second half will be devoted to current case material with both radiographic and endoscopic findings.
AUDIENCE: Radiologists, Gastroenterologist and other interested physicians
CONTACT: James J. Farrell, M.D., (803) 733-3295
FACULTY: USC School of Medicine, Dept. of Radiology; Division of Gastroenterology, Internal Medicine and Guest Speakers
CME CREDIT: 1 Hour AMA Category I per session

MONDAYS 7:00 A.M.
ORTHOPAEDIC GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital - 1st Floor
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

MONDAYS 4:00 P.M. (September only)
BASIC SCIENCES SEMINAR SERIES
CONTACT: Louis Terracio, Ph.D., (803) 733-3373

MONDAYS-THURSDAYS 12:00-1:00 P.M.
INTERNAL MEDICINE LECTURE SERIES
Richland Memorial Hospital 7 West Classroom
CONTACT: J. O'Neal Humphries, M.D., (803) 765-6563

1st & 3rd MONDAY 12:30 P.M.
G.I. JOURNAL CLUB
Dorn Veterans' Hospital Room 5A127
CONTACT: John Orchard, M.D., (803) 776-4000 Ext. 673

MONDAYS, TUESDAYS, WEDNESDAYS, & THURSDAYS 12:00-1:00 P.M.
FAMILY PRACTICE CONFERENCE
COLUMBIA, Richland Memorial Hospital, Large Dining Room of the Cafeteria—Mondays—Family Practice Conference Room—Tuesdays and Thursdays
SPONSOR: Dept. of Family Practice, USC School of Medicine
AUDIENCE: Family Practice and Internal Medicine Physicians and Medical Students
CONTACT: Roslyn D. Taylor, M.D., (803) 765-6118, Dept. of Family Medicine Richland Memorial Hospital, Columbia, SC
FACULTY: Dept. of Family Medicine and Internal Medicine, USC School of Medicine
CME CREDIT: 1 Hour AMA Category I per session

TUESDAYS 7:00 A.M.
BASIC SCIENCE & PATHOLOGY ASPECTS OF ORTHOPAEDICS
Richland Memorial Hospital - Radiation Therapy Conference Room
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

3rd TUESDAY 12:30 P.M.
OB/GYN GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital
SPONSOR: USC Dept. of OB/GYN, RMH, MUSC, Spartanburg and Greenville
DESCRIPTION: One of a series of live interactive broadcasts over the HCN, a statewide closed circuit TV network for CME in OB/GYN.
CONTACT: Ronald B. Wade, M.D., (803) 765-7156
FEE: None
CME CREDIT: 1 Hour AMA Category I (per session)

FRIDAYS 8:00 A.M.
PEDIATRIC GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital
SPONSOR: USC School of Medicine, Dept. of Medicine
CONTACT: Warren Derrick, M.D., (803) 765-7211
CME CREDIT: 1 Hour AMA Category I (per session)

WEDNESDAY 12:00 NOON
PSYCHIATRY GRAND ROUNDS
Hall Institute Form
CONTACT: Bonnie Ramsey, M.D., (803) 758-8052
CME CREDIT: 1 Hour AMA Category I (per session)

4th WEDNESDAY 12:00 NOON
PATHOLOGY: MORTALITY TEACHING CONFERENCE
Room 3A110, Building 100, Dorn Veterans' Hospital
CONTACT: Nicholas J. Pappas, Jr., M.D., (803) 776-4000, Ext. 394 or 396
CME CREDIT: 1 Hour AMA Category I

2nd & 4th WEDNESDAY 12:00 NOON
PULMONARY MEDICINE CHEST CONFERENCE
Richland Memorial Hospital, 7th Floor Conference Room
1st & 3rd THURSDAYS 12:00 NOON
3rd Floor Conference Room, Dorn Veterans' Hospital
CONTACT: Gerald N. Olsen, M.D., (803) 733-3112

WEDNESDAYS 6:00 P.M.
ORTHOPAEDICS PROBLEM CONFERENCE
Richland Memorial Hospital Conference Room "P", ACC II
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

THURSDAYS 10:00 A.M.
HEMATOLOGY/ONCOLOGY GRAND ROUNDS
Dorn Veterans' Hospital, 5-West Classroom
CONTACT: George P. Satiano, M.D., (803) 733-3112

4th THURSDAY 12:00 NOON
G.I. RESIDENTS CONFERENCE
Dorn Veterans' Hospital, 4th Floor Conference Room
CONTACT: John Orchard, M.D., (803) 776-4000, Ext. 673

1st THURSDAY 4:00 P.M. (September only)
RADIOLOGY DEPT. CONTINUING EDUCATION CONFERENCE
USC School of Medicine Library Bldg., Room B-116
CONTACT: David F. Adcock, M.D., (803) 733-3295
CME CREDIT: 1 Hour AMA Category I

THURSDAYS 12:00 NOON-1:00 P.M.
ENDOCRINE CASE PRESENTATION
USC School of Medicine Administration Bldg. 2nd Floor Conference Room
CONTACT: Juraj Osterman, M.D., (803) 733-3112

FRIDAYS 7:00 A.M.
ORTHOPAEDIC SUB-SPECIALTY TOPICS
Richland Memorial Hospital - Large Private Dining Room
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

FRIDAYS 9:30 A.M.
PREVENTIVE MEDICINE GRAND ROUNDS
USC School of Medicine Library Bldg. Room 327
CONTACT: Alan Chovil, M.D., (803) 733-3306
CME CREDIT: 2 Hours AMA Category I

3rd FRIDAY 12:00 NOON-1:30 P.M.

NEUROPSYCHIATRY AND BEHAVIORAL SCIENCES
Dix Conference Room, William S. Hall Psychiatric Institute
CONTACT: Robert J. Pary, M.D., (803) 758-3068

FRIDAYS **1:00 P.M.**
INTERNAL MEDICINE GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital Auditorium
SPONSOR: Dept. of Medicine, USC School of Medicine
AUDIENCE: Internal Medicine and Family Practice Physicians
CONTACT: J. O'Neal Humphries, M.D., Chairman, Dept. of Medicine, (803) 765-6563
CME CREDIT: 1 Hour AMA Category I

SATURDAYS **9:00-10:00 A.M.**
SURGICAL GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital Auditorium
SPONSOR: USC School of Medicine, Dept. of Surgery
DESCRIPTION: Lectures and case presentations given by the department staff and guest speakers
AUDIENCE: Faculty, Residents, Students and Private Clinicians
CONTACT: Carl H. Almond, M.D., (803) 254-4158; James L. Haynes, M.D., (803) 765-7452; Frederick L. Greene, M.D., (803) 776-4000, Ext. 582
FACULTY: Staff of Dept. of Surgery and guest lecturers
CME CREDIT: 1 Hour AMA Category I (per session)

GRAND ROUNDS
Medical University of South Carolina

MONDAYS **8:30-9:30 A.M.**
PATHOLOGY (ext. 3121) Surgical Pathology Conference
Quadrangle - Room E215

MONDAYS **12:30-1:30 P.M.**
RADIOLOGY (ext. 5071) Noon Conference
Hospital — Room B317

MONDAYS **4:00-5:00 P.M.**
RADIOLOGY (ext. 5071) Special Imagining Conference
Hospital — Room B312

MONDAYS
RADIOLOGY (ext. 5071) Visiting Radiologist
Hospital — Room 315B

EVERY OTHER MONDAY **10:00 A.M.-12:00 NOON**
PATHOLOGY (ext. 3121) Pathology Microscopic Roundtable Conference
Quadrangle Building — Room E215

4th MONDAY **2:30-3:30 P.M.**
LABORATORY MEDICINE (ext. 2858) Phlebotomist: Inservice Update Program
Hospital — 2 West Classroom

TUESDAYS **7:00-8:00 A.M.**
SURGERY (ext. 3961) Surgical Grand Rounds - Cancer Conference
2-W Amphitheater —MUH

TUESDAYS **9:00-10:00 A.M.**
MEDICINE GRAND
CONTACT: Jane C. Allen, M.D., (803) 792-2911

TUESDAYS **7:00-8:00 A.M.**
ORTHOPAEDIC SURGERY (ext. 3934) Grand Rounds — Weekly
MUSC — Room 428

TUESDAYS **11:00 A.M.-12:00 NOON**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4050)
Departmental Grand Rounds — MUH Amphitheater

TUESDAYS **12:30-1:30 P.M.**
OBSTETRICS/GYNECOLOGY(ext. 4509)
TV Grand Rounds in Obstetrics and Gyncology
MUH — Amphitheater

2nd & 4th TUESDAY **1:30-3:00 P.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE 577-5011 (ext. 234)
Case Conference
Veterans' Administration Hospital

TUESDAYS (as scheduled) **9:00-11:00 A.M.**
PATHOLOGY (ext. 2456/3121)
Seminar-Tutorial Groups Sessions, Systemic Pathology
Basic Science Building or Quadrangle (where scheduled)

TUESDAYS **8:30-9:30 a.m.**
OBSTETRICS/GYNECOLOGY (ext. 4509) Morning Conferences
Clinical Science Building — Room 624

TUESDAYS **2:00-3:30 P.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4050)
Adult Outpatient Case Conference
University Service Building — Chairman's Conference Room

2nd & 4th TUESDAY **4:00-5:00 P.M.**
PATHOLOGY (ext. 3121) Renal Conference
Basic Science Building — Room 648

1st & 3rd TUESDAY **4:00-5:00 P.M.**
PATHOLOGY (ext. 3121)
Gastrointestinal Pathology Conference (GI Conf)
Basic Science Building — Room 648

WEDNESDAYS (except last) **9:00-10:00 A.M.**
PATHOLOGY (ext. 2131) Graduate Medical Education in Pathology
Basic Science Building — Room 648

LAST WEDNESDAY **9:00-11:00 A.M.**
PATHOLOGY (ext. 3121) Grand Rounds — Pathology
Basic Science Building — Room 648

WEDNESDAYS **10:00-11:00 A.M.**
LABORATORY MEDICINE (ext. 2671) Blood Bank Conference
Quadrangle/Pharmacy — Room 209/310

WEDNESDAYS **12:00 NOON-1:00 P.M.**
PSYCHIATRY & BEHAVORIAL SCIENCE (ext. 4037)
Psychiatry Journal Club
University Service Building — Chairman's Conference Room

WEDNESDAYS **1:00-2:00 P.M.**
LABORATORY SERVICES (577-5011 ext. 466)
Charleston Veterans' Administration Clinical Pathology Conference
Veterans' Administration Hospital — Room B-243

4th WEDNESDAY **2:30-3:30 P.M.**
CYTOTECHNOLOGY/HISTOTECHNOLOGY (ext. 2041)
Histotechnology Journal Club
Quadrangle — Room QE 215

WEDNESDAYS **3:00-4:00 P.M.**
PATHOLOGY (577-5011 ext. 466)
Charleston Veterans' Administration Medical Center Tumor Board
Veterans' Administration Hospital

WEDNESDAYS **3:00-4:00 P.M.**
LABORATORY MEDICINE (ext. 2933) Hematology Conference
Quadrangle — Room B-106

WEDNESDAYS **6:30 P.M.-?**
OBSTETRICS/GYNECOLOGY (ext. 4509)
Monthly Journal Club Meeting — Outside Location

WEDNESDAYS **6:00-7:00 P.M.**
RADIOLOGY (ext. 5071) Low Country Ultrasound Society
Hospital — Room B-317

THURSDAYS **8:30-9:30 A.M.**
OBSTETRICS/GYNECOLOGY (ext. 4509) Morning Conference
Clinical Science Building — Room 624

THURSDAYS **8:00-9:00 A.M.**
RADIOLOGY (ext. 5071) Teaching Conference in Neuroradiology
Hospital — Room B-317

THURSDAYS **8:30-10:00 A.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4037)
Psychiatry Youth Conference — Clinical Science Building - Room 623C

THURSDAYS **8:30-10:00 A.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4037)
Teaching Case Conference for Consultation/Liaison Service
Clinical Science Building — Room 623C

THURSDAYS **8:30-10:00 A.M.**
PSYCHIATRY (ext. 3051) Child Psychiatry Seminar
Clinical Science Building — Room 623C

THURSDAYS **9:30-10:30 A.M.**
NEUROSURGERY (ext. 2421) Neurosurgery Clinical Conference
Clinical Science Building — Room 428

THURSDAYS **10:30-11:30 A.M.**
NEUROLOGY (ext. 3221) Neurology Grand Rounds
Clinical Science Building — Room 300

THURSDAYS **10:30-11:45 A.M.**
NEUROSURGERY (ext. 2421) Neurosurgery Lecture
Clinical Science Building — Room 300

THURSDAYS (as scheduled) **9:00-11:00 A.M.**
PATHOLOGY (ext. 2456/3121)
Seminar-Tutorial Group Sessions, Systemic Pathology
Basic Science Building or Quadrangle (where scheduled)

THURSDAYS **12:00 NOON-1:00 P.M.**
PATHOLOGY (ext. 3581/3121) Neuropathology Conference
Basic Science Building — Room 737

THURSDAYS **1:00-2:00 P.M.**
PATHOLOGY & DERMATOPATHOLOGY (ext. 3821/3121)
Dermatopathology Conference — Quadrangle-Room E215

THURSDAY (once/month) **2:30-3:30 P.M.**
LABORATORY MEDICINE (ext. 2671)
Immunohematology Journal Club — Quadrangle Room 104

THURSDAYS **4:15-5:30 P.M.**
NEUROSURGERY (ext. 2421) Neurosurgery Didactic Lectures
Clinical Science Building — Room 428

1st THURSDAY **5:30-7:30 P.M.**
NEUROSURGERY (ext. 2421) Journal Club

FRIDAYS **8:30-10:00 A.M.**
MEDICINE/ENDOCRINOLOGY (ext. 2528)
Endocrinology Journal Club, Endocrinology Research Conference
Clinical Science Building — Room 910

FRIDAYS **10:00-11:30 A.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE
Teaching Case Conference, Adult Inpatient
MUH — Room 7W Conference Room

FRIDAYS **12:00 NOON-1:00 P.M.**
PATHOLOGY (ext. 3556/3121) Clinico-Pathologic Conference (CP
Mu Hospital — Room 2W Ampitheater

FRIDAYS **2:30-4:00 P.M.**
MEDICINE (ext. 2000) Division Rounds (Case Conference)
of the Division of Rheumatology & Immunology
Clinical Science Building — Room 912

FRIDAYS **4:00-5:30 P.M.**
MEDICINE/ENDOCRINOLOGY (ext. 2528)
Endocrinology Case Conference
Clinical Science Building — Room 906E

FRIDAYS **8:30-9:30 A.M.**
PATHOLOGY (ext. 3121) Surgical Pathology Conference
Quadrangle — Room E215

FRIDAYS **12:30-1:30 P.M.**
RADIOLOGY (ext. 5071) Noon Conference
Hospital — Room B317

FRIDAYS **4:00-5:00 P.M.**
RADIOLOGY (ext. 5071) Special Imagining Conference
Hospital — Room B312

FRIDAYS
RADIOLOGY (ext. 5071) Visiting Radiologist
Hospital — Room 315B

FRIDAYS **8:30-9:30 A.M.**
OBSTETRICS/GYNECOLOGY (ext. 4509) Morning Conferences
Clinical Science Building — Room 624

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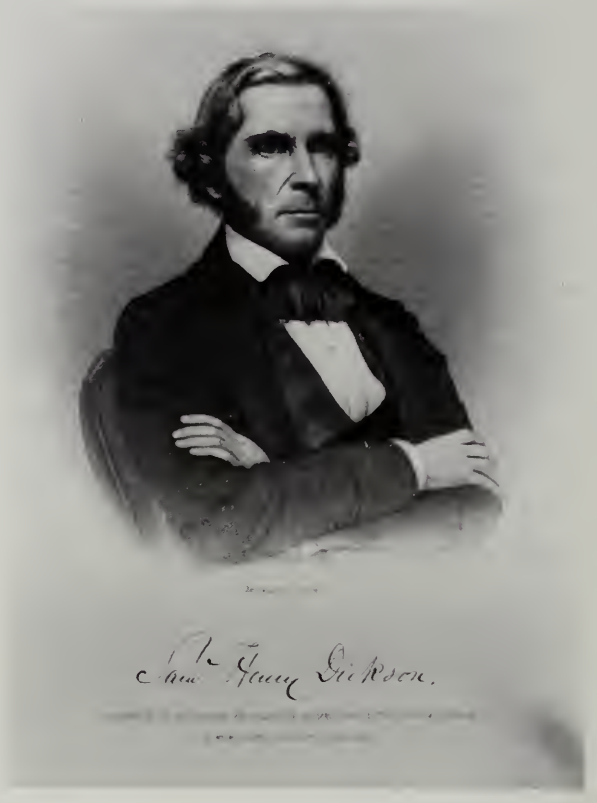
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ON THE COVER:
ELOCUTIONARY UTTERANCES, MEDICAL EDUCATION AND SAMUEL HENRY DICKSON, M.D.



In 1824, the doors opened at the Medical College of South Carolina in Charleston. Samuel Henry Dickson, M.D., (see inset) was elected Professor of the Institute and Practices of Medicine and held the honor of making the introductory address when the doors of the Medical College first opened. On the cover is the title page of his book in which a syllabus was prepared for the use of his class of medical students in South Carolina.

Described by Joseph Waring, M.D., as "among the relatively few vigorous and vocal proponents of reforms of American medical education during the early part of the nineteenth century," Dr. Dickson was largely responsible for the establishment of the Medical College of South Carolina. "An able clinician, an advanced educator, a prolific writer, capable author and beloved citizen, he left a marked impression on his contemporaries and the many institutions with which he was associated in his early years both in South Carolina, New York and Pennsylvania."

Dr. Dickson was born in Charleston, S. C. in 1798. He took his preliminary education at the College of Charleston and later studied at Yale College. Following his graduation from Yale, he volunteered for services in the war of 1812 and returned to South Carolina to study under Dr. P. G. Prioleau. He took his M.D. degree from the University of Pennsylvania where he graduated in 1819. He presented his doctoral thesis on the temporary yellow fever epidemic in Charleston during 1817.

Dr. Dickson began his practice in Charleston about 1819 in association with Charles Glover, M.D. who was in charge of one of the temporary yellow fever hospitals in Charleston. Dr. Dickson became very involved in the local medical licensing political activities of the time and was a leader of the Medical Society of South Carolina. Around 1821 Dr. Dickson began discussions with Drs. Henry R. Frost and James Ramsay regarding the establishment of a medical institution to train South Carolinians and other southerners in medicine, particularly involved in the better understanding of conditions more prevalent in the local area than those found in the northern climates and more deeply studied in northern institutions. The eventual outcome of their intense interest was the establishment of the Medical College of South Carolina which uniquely was evolved under legislative authority as a private institution but without financial assistance from the state. Dr. Dickson was an eager and active promoter of medical education. His successes in South Carolina led him to the chair of practice at New York University, and later at Jefferson Medical College in Philadelphia. One of South Carolina's best known physicians, J. Marion Sims, M.D. was one of Dr. Dickson's students at the Charleston School. A great admirer of Dr. Dickson, Dr. Sims remembered him as a "small man, very handsome, with a sweet, musical voice; a man of great literary acquirements, a fluent speaker, logical in his reasoning, convincing in his manner."

Early to recognize the importance of preventive medicine, in 1854 Dr. Dickson served on an American Medical Association committee which was involved in evaluating the importation of diseases into the states by immigrants. Clearly an individual gifted in oratory and elocution, an

observer noted that Dr. Dickson was not only personally popular but stood out as an elegant orator on a variety of subjects noting that "the affluence of his mental resources and the chastened harmonies of his elocutionary utterances gave him a predominance in colloquial discourse which commanded attention while it enlightened and always pleased." A successor to Dr. Dickson's chair at Jefferson Medical School, J. M. Da Costa, M.D., reported that Dr. Dickson "retained to the last the grace of delivery and the flow of refined language which made him at 40 the most distinguished lecturer in his branch in the South."

The Confederate War saw the removal of over 200 of Jefferson Medical School's medical students to the South and with his southerly retreat Dr. Dickson lost a great portion of his income as a lecturer. With these final difficulties Dr. Dickson removed from his academic position and on March 31, 1872, he died.

It was said that "the one thing most conspicuous about Dickson, among doctors, was the charm of his writing."

— Thomas M. Leland, M.D., Ph.D.

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A WORD TO THE WHYS

WHY AMA?

The AMA helps maintain high standards in Continuing Medical Education through its participation in the Accreditation Council for Continuing Medical Education (ACCME). The AMA also helps reduce the high cost of CME by offering 28 Video Clinic study courses for CME credit. Upholding CME standards and providing cost-effective CME alternatives: it's one more good reason why you should be a part of the AMA.

WHY AMA? The AMA provides a democratic forum where you, along with your colleagues across the country, can raise and argue issues, reach a consensus and formulate policy. AMA policy is then translated into practical actions on issues that affect you and your practice. Making sure medicine stays active, strong and united: it's one more good reason why you should be a part of the AMA.

WHY AMA? The AMA has taken an important initiative in combating prescription drug abuse. An informal steering committee organized by the AMA has developed a data analysis system that would help states detect sources of prescription drug diversion. Cracking down on prescription drug abuse: it's one more good reason why you should be part of the AMA.

To Join, Contact your county or state medical society or write: Division of Membership, AMA, 535 North Dearborn Street, Chicago, Illinois 60610 or call collect, (312) 751-6196.

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FINANCIAL CHECKUP

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Vol. 6, Issue No. 6 June 1986

ARE YOU PREPARED TO FINANCE A COLLEGE EDUCATION

Zero Coupon Corporates.

In general, zero coupon corporate bonds offer the highest yield of all zero coupon securities. And, if you are trading-oriented, they provide the opportunity for capital gains if interest rates decline. Conversely, if rates rise, shorter maturities will afford you greater price protection than is generally available from longer-term investments. It is important, however, to keep in mind that zero coupon corporates are not insured by any organization; the quality of your bond is dependent on the quality of the issuing company.

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Zero coupon municipal bonds offer state and local government entities an attractive means of funding public projects. They offer you what may well be the most popular college funding vehicle today. Muni zeros provide an attractive growth-oriented investment (appreciation may equal as much as 25 times your original investment), and an attractive investment strategy as well - especially if you have already reached your limits on gifting. Because municipal bond income is federally tax exempt (and, in many cases, exempt from state and local taxes as well), muni zeros can be kept in your own name, and not placed within the confines of a Clifford trust or custodial account. Since they won't become your child's assets you won't have to worry about your child buying a sports car with the money. In addition, you can sell the bonds at any time, although the price you receive will vary depending on prevailing interest rates.

In general, zero coupon municipal bonds are considered second in security only to U.S. Government securities. Because the creditworthiness of each issuing municipality will vary, credit-enhanced issues (those insured by major companies) have become quite popular.

Leave the Driving to Us.

For investors who wish to participate in the securities markets but have neither the time, inclination nor expertise to compile and monitor a diversified portfolio, Hutton offers the following vehicles:

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One of the fastest growing types of mutual funds, growth funds invest in stocks believed to offer long-term growth potential. Based on the average performance of 35 growth and income funds in existence over the past 10 years, an investment of $10,000 on January 1, 1975 would have grown to $41,718 by December 31, 1984.* This represents a total increase of 318.4% during this period, and a compound rate of annual return of 15.4% per year -- an extremely attractive rate compared with alternative investments.

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If you would like to participate in a securities portfolio - and want the security of knowing exactly what you own at all times - the unit investment trust may be of interest. Like a mutual fund, the unit trust is a diversified portfolio of securities that have been professionally selected with a specific goal in mind. Once selected, these securities are not traded. Instead, they are sold after a given period of time and the proceeds are distributed. Or, if you prefer to add the power of compounding to your investment, you may opt to have the distributions reinvested. An investment of as little as $1,000 offers you a fractional interest in all of the securities in the portfolio, and their sale proceeds as well.

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* Investment Company Institute. The maounts shown are after deducting an initial 8½% sales charge, and assumes that all capital gains distributions and dividends are reinvested

**There is a deferred sales charge on funds withdrawn within the first six years of purchase. But it is calculated on a declining scale from the first to the sixth year, and it's assessed only if the withdrawal reduces the current account value below the principal you invested. Consult the prospectus for further details.

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If you would like to receive further information on any of the topics covered in this newsletter, please write to Martin Lefkowitz, CFP, E.F. Hutton & Company, Inc. 2700 Middleburg Drive, Suite 200, Columbia, SC 29204; or Call (800) 922-1112.

President's Page



HMO DILEMMA

As I have talked to physicians and other citizens in the state the last several weeks, I have been impressed, as another topic for discussion — other than tort reform — is in their minds: namely, HMOs.

My principal response to questions asked about HMOs is probably yours — little experience with them, little knowledge about them, and an abiding wish that they — like toxic waste — would simply go away.

I have perceived, however, in my limited exposure to the HMOs around our state, several things:

(a) They are not the immediate boon and solution to health care which the government and industry have believed them to be.

(b) Even the people who are presumably "experts" in establishing them and running them don't seem to know much about them (to wit, Columbia's experience with CharterMed, Inc.).

(c) "Big" is not necessarily "good."

(d) I continue to feel that the quality of health care is not a factor in their equation.

If one stops and thinks about HMOs, it is clear that they add rather than subtract from the health care dollar. Like governmental bureaucracies, they insert another "level" to be funded. This money comes from the hospitals, physicians, pharmacies, laboratories and all providers of health care into the pockets — ultimately — of stockholders and administrators.

This, therefore, returns me to an original premise of mine — that "fee for service" remains the most desirable of health care alternatives. It should be, could be and would be the most cost effective, if not for the green-eyed monster "GREED" of which, undeniably, many segments of medicine — including physicians and hospitals — are guilty. In addition, quality of care, I feel is best maintained and preserved in the private practitioner's office, as opposed to the increasingly apparent "clinic" atmosphere which HMOs — particularly gatekeeper HMOs — utilize.

HMOs, unfortunately, will likely not "go away." Physicians are well advised to approach "contract medicine" carefully, even if its effect ultimately is to encroach on their patient population.

Walter J. Roberts, Jr., M.D., *President*

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INFORMATION FOR AUTHORS

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THE JOURNAL
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VOLUME 82 JULY 1986 NUMBER 7

ISSUES IN LONG TERM CARE FOR THE ELDERLY: INTRODUCTION

This **special issue** of the *Journal of the South Carolina Medical Association* has been organized by the South Carolina Federation of Older Americans° for the generic purpose of enhancing the awareness of State medical and health professionals concerning the growing need for services among our increasing numbers of elderly citizens. More specifically, the **special issue** is designed to identify and analyze various alternative measures for long term care that are in place or under consideration for the aging segment of our population. Long term care must be provided for larger numbers who live in their own homes, within the community, or reside within institutional settings.

We wish to thank the South Carolina Medical Association, the Editor of its Journal, and the Editorial Staff for making possible the publication of these compendia on alternative strategies for long term care for the elderly. The Federation is grateful to the South Carolina Department of Social Services for assistance with the publication costs.

This **special issue** would not be possible without the perceptive insight of Emeritus Professor W. Hardy Wickwar, the organizational skills and diligence of Professor C. Blease Graham, the analytical perspectives of Dr. Charles N. Still, and the cooperation and patience of our contributing authors. On behalf of the Federation membership, thank you for participating as writers and as readers. □

GEORGE P. FULTON, Ph.D.
Immediate Past President,
SCFOA, 1986

° The South Carolina Federation of Older Americans (SCFOA) is a tax-exempt volunteer organization chartered by the State of South Carolina in 1971. It has members in every county. The Federation is the independent non-governmental voice of senior citizens of South Carolina. However, it enjoys a healthy working relationship with the South Carolina Commission on Aging, Area Agencies on Aging, County Councils on Aging, and local service agencies. The SCFOA sponsors activities that benefit the state's older citizens. It fosters programs to improve the physical, mental, economic and social well-being of seniors. It provides activities to enable older South Carolinians to stay active in the mainstream of life in their communities, such as monthly Legislative Forums, Senior Citizens Day with the Legislature, and opportunities for volunteer services. The federation publishes a quarterly magazine (*Senior Circle*), a bimonthly newsletter (*News Notes*), and a monthly report on legislative matters (*Legislative News Letter*).

APPROACHES TO THE STUDY OF LONG TERM CARE

HARDY WICKWAR*

THE WOODS AND THE TREES

Shall we think about big principles and how to apply them? or shall we look at our present endeavors and seek ways to improve them little by little and bit by bit?

Both are important and both have been tried.

MACRO-PLANNING

Bismarck in the 1880s thought big when he dreamed of strengthening his new German Empire by compulsory insurance of wage-earners against the risk of losing their livelihood from all kinds of disability, old age included. That innovation has since been diffused and adapted in every economically developed country in the past fifty years, including the United States.

Mechnikov in 1903 thought big, when he wrote that the preventive medicine to which he was contributing at the Pasteur Institute was extending life so immensely that we would need a new science that he called *gerontology.*

Today the time has come when we again need a broad view.

Several elements of this broad view are beginning to appear.

On the medical front, Mechnikov's dream — our all reaching our natural term, whatever that may be, and then dying a natural death — has run up against pathologies that have not yet been and probably cannot be explained in a simple and preventible cause-and-effect way as damage done by bacteria and viruses. These unfathomed pathologies have come to plague us especially in our later years, when, irreversible and chronic, they have called for care rather than cure.

One such disorder has come to be particularly associated with continuing and terminal long-term care: Alzheimer type dementia, to which **Alexander Donald** and **Charles Still** have devoted eloquent articles.

With all of these plagues of our later years, the essential challenge is a scientific one; and it may well be one of the most vital challenges that face the human species as this stage in its evolution. Meanwhile we wallow in imperfect technologies that offend our sense of what is scientifically, ethically and fiscally rational and sustainable.

The resulting Twilight of the Gods drama of humans taking the last step in controlling their own destiny by asserting not only a right but also a duty to die, is here the subject of **Nora Bell**'s article.

Meanwhile the last third of our lives — *le troisieme age* as our French-speaking fellow humans call it — includes years not only of active living but also of decline amid multiple and growing disabilities. Aging individuals, like others, may need both support and care, and may need support and care intermittently before they need it continuously, and may often need increasing measures of support before becoming dependent on fulltime care. Support has to be manysided and come from many sources, both inside and outside the family or household, while care has to be familial and domiciliary even more than medical or medicalized.

For a person of declining capacity in a family or household of limited knowledge and overwhelming challenges it may be hard to find a way amid the competing vendors of formal support and care without advice and counsel from some formally organized source. How far this professional advisor should be a generalist/primary care physician, doing for the old as a geriatrician what the pediatrician does for the young, is discussed here in an article contributed by **Shawn Chillag.** How far it might be a case-managing public health nurse or social worker, in the community at large or in a Social/Health Maintenance Organization, is touched upon in the article of **John Capitman.**

Whether the support services are adequate and comprehensive depends to some extent on the

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realization of Arthur Flemming's dream of an Older American advocacy network of public aging agencies at the federal, state and areas levels through which coordination might be reached with specialized agencies, grants made to services organized by non-governmental local community councils on aging, and service contracts entered into with membership associations of senior citizen retired persons.

The potential and actual contributions of this network to long-term care both in the community and institutions in South Carolina are reported in the last article which describes the **Networks** of agencies which administer programs for the aging, including a directory of services for each county in South Carolina.

Can one go further and stimulate debate both about long-range goals and about measures for immediate change? A White House Conference on Aging and our related state bodies have provided an opportunity for an assemblage of diverse viewpoints decade by decade.

MICRO-PROJECTS

In every economically developed country there are now major nationwide public resource allocation programs for helping senior citizens, both aging and aged, to obtain not only the means of livelihood, as Bismarck planned, but also health and other services they need for their long-term and other support and care. Once established these then became a base for incremental updating by way of expansion, contraction or detailed technical change.

Exceptionally, these formally organized public programs form integrated systems which both finance and deliver long-term and other care. Such in the United States are the national Veterans Administration and this State's Department of Mental Health, in both of which there are important developments for long-term care that are here described by **Shawn Chillag** and **Alexander Donald.** Such also is Britian's National Health Service, the geriatric experiments of which have been observed in Scotland by both contributors.

More commonly, formally organized public programs have made a point of separating the financing from the delivery of long-term and other care; and of this division of function the United States provides the world's biggest example. Here the organized financing of long-term care is mainly public, through national Medicare insurance for almost all elderly persons and state Medicaid assistance for those of them who fall below the national poverty line. The delivery of the care itself, on the other hand, has been left to a wide variety of vendors, public and private, nonprofit and for-profit. **Eric Pfeiffer** describes a model of transitions for comprehensive integration of health and long-term care services for the elderly, poor and non-poor.

Under this dual system the question of the exact relationship between financing and delivery becomes crucial. This dual system opens up a set of interesting developmental possibilities. Changes can be made in the interrelationship between financing and delivery without basic change in the system as a whole or in either of its two major components. The changes can be limited and technical in their nature. They can be hypothesized, and the hypothesis then be tested experimentally. The system can itself pay for the experiment by waiver of a few specific regulations. Experiments can then be monitored in detail both individually and collectively so as to provide as scientific a control as possible of a limited and defined technical change. Project-by-project experimentation has thus become a standard technique for incremental change management in this service aspect of the American social security system.

In long-term care a common theme in such projects has been the use of public purchasing power to finance a more comprehensive and less medical approach than Medicare-financed extended care in skilled nursing facilities and home health service or Medicaid's underwriting of intermediate nursing facility costs.

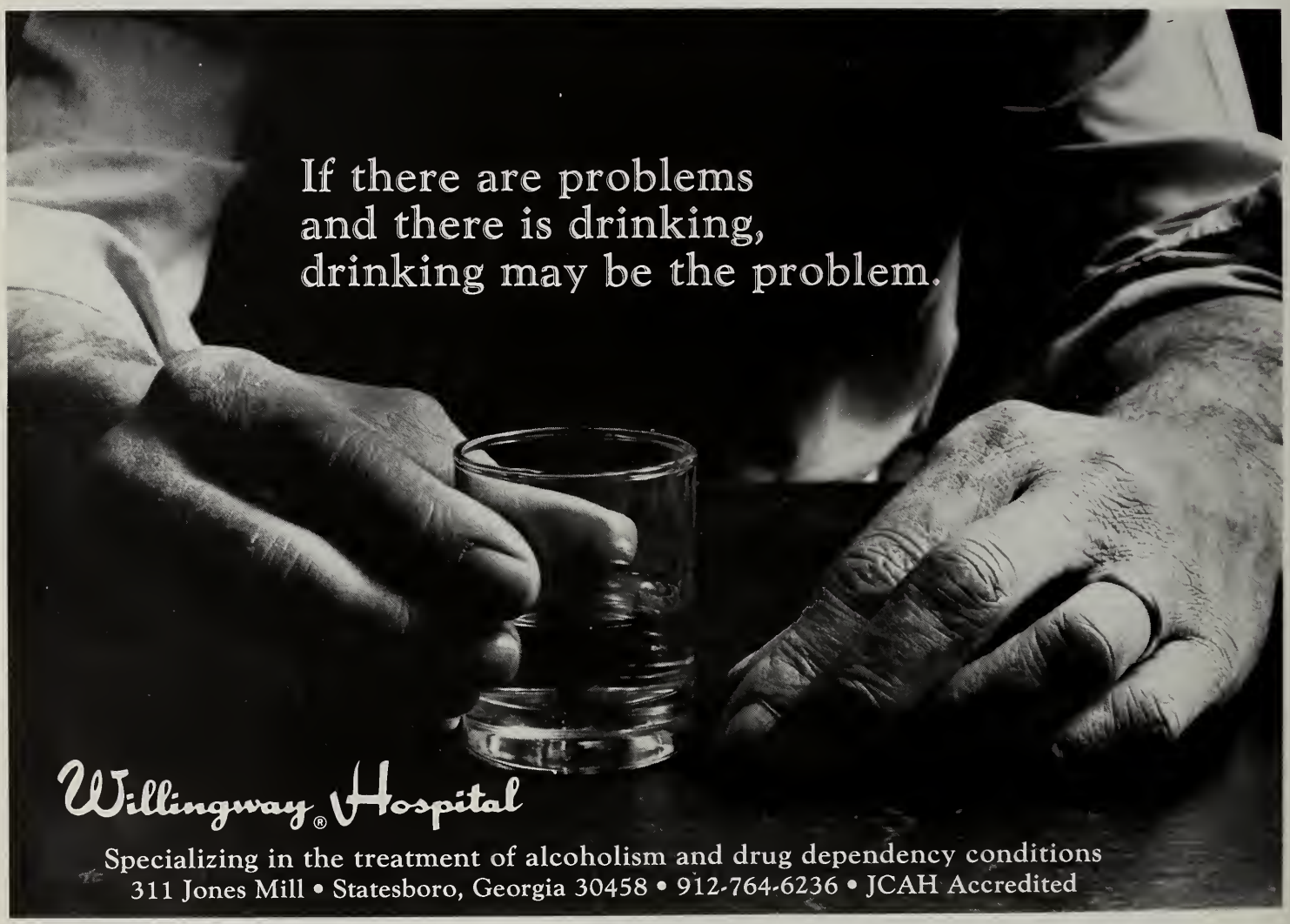
One such project has been South Carolina's experiment in Community Long Term Care (CLTC), which has aimed at restraining the growth in nursing home beds by making essential personal and health services accessible to Social Security recipients in the local community on Medicaid waivers as an alternative to institutionalization. By exercising external controls on admission to nursing homes, CLTC has claimed that the public cost of community services is no greater than if the participants received similar services in long-term care facilities.

It was this South Carolina experiment that inspired this special number of the *Journal.* It is here looked at from inside through the contribu-

tions of Commissioner **Robert Jackson** and of **Tom Brown** and **Don Blackman.** There is also a view of a special two county project in South Carolina, **The Health Impaired Elderly Project** by **Lynn Frederick.** Long term care is also looked at from the outside and in relationship to the whole set of projects of which it is a part in the contributions of **John Capitman** and **Eric Pfeiffer.**

Two additional articles describe special projects. **Hilda Ross** describes a life history inservice training course. A provocative approach to integrating selected elderly citizens into college or university life is discussed by **George Fulton.**

In attempting to draw lessons from Community Long Term Care and other projects for possible wider application there are a number of criteria that one may wish to bear in mind. The overriding one may be the ethical desirability of giving old people and their families the alternatives of care at home or in an institution without biasing their choice one way or the other by financial considerations. Another may be a fiscal desire not to increase public expenditure on care in the community above that of long-term care in an institution, or to unnecessarily substitute formal public control for informal family responsibility. A third is the probability that an institutional population may not provide a wholly valid control group for the community care population, since more of its members may have come direct from hospital, more may be childless widows and others who do not have families that can care for them, and more may represent a more advanced stage of dependence on others for the activities of daily living. □



THE CRISIS OF INCREASED LIFE EXPECTANCY

ALEXANDER G. DONALD, M.D.*

During a sabbatical leave in Glasgow, Scotland, I was most impressed with the care given the elderly in Great Britain. There is a department of geriatrics at each of their medical schools. The number of registrars (residents) in geriatrics equals those in pediatrics. There is a comprehensive range of services geared to keep older people active and at home, some examples of which are as follows.

They can ride the bus for six pennies anywhere except during peak hours of travel to and from work, i.e., 7:30 to 9:30 a.m. and 4:30 to 6:30 p.m., when they pay regular fares. They can ride the train for three pounds anywhere in Great Britain during the whole month of November, encouraging them to travel and to maintain involvement.

Homes owned by the District Health Council are scattered throughout all housing areas and rented to the elderly for minimal amounts. If needed, their homes are equipped with buzzers which can call for help to a central station. Home visitors of varied skills and expertise are available (house cleaners, cooks, nurses, doctors, etc.). Transportation is available on a regular schedule.

Outpatient health services, day care clinics, and inpatient units are available as needed. I visited several inpatient units on which the average age was 85. They speak of the old and the very old (over eighty). The following statistics point to the wisdom of such elaborate programs to keep older people at home: 96 percent are at home; two percent are in even tide or nursing homes; two percent are in the hospital. The latter two percent accounts for 50 percent of the Health Service hospital beds. A shift in balance of one percent would create the need for 25 percent more hospital beds. House calls by family physicians are the rule rather than the exception. The decision to institutionalize an older person is usually made in his home rather than in the hospital as is frequently true in the United States.[1]

My interest in geriatrics was greatly stimulated by my experience in Scotland. The goal of this paper is to set forth the nature and scale of changes in the number and proportion of old and very old people, the reasons for these changes, and the implications for the health care and support of the elderly.

Going on Social Security has become a milestone of American life. There are twenty-five million Americans 65 and over, representing more than 10 percent of the population of the United States. This is the single largest minority in the country. Those over 65 comprised three percent of the population in 1900, and nearly 10 percent in 1972; the elderly are projected to reach 17 percent (or approximately fifty million) in 2020. While the total U. S. population tripled from 1900 to 1980, those persons 65 or older increased eight times — all of this shows that the elderly are the fastest growing segment of the population. While the total human life span has increased very little if at all, the average life expectancy has increased markedly. This increase in life expectancy reflects improved health care, whereas the unchanged potential life span reflects the aging process, shown in Figure 1.[2]

Just as night does not fall at once, so it is true no man is young one day and old the next; but in between there is a twilight period during which a

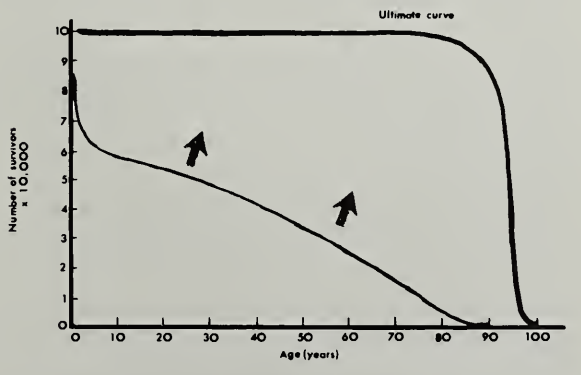


FIGURE 1. The squaring of the curve: actual life expectancy vs. theoretical lifespan.

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great deal is going on. In attempting to present some of the more common stresses which are frequently involved in this most dynamic period, I shall now draw upon the contributions of the late Jack Weinberg, M.D., a true pioneer in geriatric psychiatry.[3]

There is a gradual loss of meaningful others. These losses are more easily replaced in the young. With the elderly, there is a decrease in choice and a decrease in attractiveness which leads to *isolation* and *aloneness*. By *isolation* I refer to a physical state, whereas by *aloneness* I refer to an intensely experienced inner feeling not related to the presence of others. One may be alone in a crowd. Statistically the male-female ratio changes: at birth, there are 105 males for 100 females; at 65, there are 100 males for 138 females. Thirty-eight percent of women between 65 and 70 are widows, whereas 10 percent of men are widowers. The relationship of loss and physical illness susceptibility has been established with the death of a spouse being the most stressful loss.

Although the physical and mental capacities of life do not decline as abruptly as many once thought, the reaction of the older person to the loss of a previously mastered physical or mental function may be quite traumatic. In fact, one of the greatest fears of late life is the fear of loss of control and thus dependency upon others. Death frequently becomes a preoccupation as they lose friends and realize that they themselves are growing older.

Human beings must have fantasies or daydreams. The elderly without a future orientation have few fantasies. They substitute memories. They repeat stories over and over. These usually involve events where they were in control, a way of saying "I wasn't always this way." They have a tendency to conserve or hoard, to save things with which experiences have been shared. The ability to recognize the need for assistance from others without losing one's self-respect can be a great asset during the aging process.

Every society or culture imparts a code of ethics or value system which includes the aging process. Each member of that society more or less accepts these values. If the elderly are unwanted and considered as selfish, hypochondriacal, interfering, unattractive, and useless, the individuals who absorb these values when they are young have a built-in self-depreciating system as they age. Then they attempt to deny their aging by avoiding other older individuals as if to say, "it isn't I that is old; it is they." When asked about going to an old age center, they might well reply, "No, there are only old people there."

Most of us would agree that the type of character that is valued in this country is the active individual who is doing something, the producer. The American value is to produce a product which can be perceived by one of our senses: heard, seen, touched, tasted, or smelled. We tend to depreciate the contemplative side of life. The chances are if you are reading and someone asks, "What are you doing?," you will reply, "Nothing." God forbid that you might be caught thinking. If you were thinking about a problem and heard the boss coming, you would probably begin to shuffle papers and feel quite content that you were doing something.

If an older person is found contemplating, we conclude that he is depressed, quickly send for an occupational therapist, and as soon as he makes a potholder, we are much happier.

Time may be divided into past, present, and future. Each culture or society relates to all three of these. America values the future. We acknowledge that we have a past, the present is fleeting, but the future is what we plan for. We are characterized as always feeling we should be somewhere else. The elderly have a much diminished future. They have worked for retirement; now they are there.

Few, if any of us, live up to our full potential. When we are younger, there is always tomorrow. As we become older, the feeling of unfulfillment tends to grow. We all have a sort of romantic legend of "self." Pictures never do us justice. We don't believe what we see in the mirror. With aging, it becomes more difficult to think of ourselves as young, active, productive individuals. About one-third of the twenty-five million over 65 are below the poverty level with many more just above it.

Each of us from birth has an inner need to be touched, to feel the body warmth of another. Somehow most adults develop an aversion to touching the elderly. Everyone says that grandparents spoil grandchildren. Children freely touch, kiss, and hold. Most elderly are starved for this. It may be that grandchildren spoil grandparents.

Older people get sick more often and heal more slowly, so that each spell of illness is longer. Brain

failure or Senile Dementia of the Alzheimer type (SDAT) is one of the most feared disorders of late adult life. SDAT is a progressive disorder resulting in deterioration of the central nervous system. The capacity for self-awareness, the ability to maintain self-esteem, memory, and behavioral patterns that made the individual a distinctive personality are lost. The deterioration of a responsible adult produces serious stress for the spouse, children, friends, and work associates. It is estimated that the disease affects about five percent of people over the age of 65 and 20 percent of those over 80.[4]

Alzheimer's Disease is not an accelerated form of normal aging, but a new and different disease state superimposed on the normal aging brain. The diagnosis of dementia is based upon a loss of intellectual abilities severe enough to interfere with social or occupational function (memory, judgment, abstract thinking, temporal orientation, visual perception, and language).[5] The patient's personality and behavior are permanently changed, so that long-term care is required, either at home or in an institutional setting.

The C. M. Tucker, Jr., Human Resources Center was opened in June 1970 by the South Carolina Department of Mental Health to provide multilevel long-term health care services to the citizens of South Carolina. The Tucker Center initially consisted of the John M. Fewell Pavilion of 150 beds for skilled and intermediate nursing care and the E. Roy Stone, Jr., Veterans Pavilion of 150 beds for intermediate nursing care to eligible veterans of South Carolina. The Frank L. Roddey Pavilion of 308 beds was dedicated on February 1, 1983. Since its initial opening the Tucker Center has maintained 95 percent occupancy, with a waiting list which grows even longer. Because of ever-increasing needs, the Dowdy-Gardner Nursing Care Center (DGNCC) was opened on March 14, 1984. This center is for patients 65 years old or older who are currently hospitalized for psychiatric reasons in the Department of Mental Health, but no longer require intensive hospital-level care. The DGNCC consists of the Farmer Building with 166 beds and the McLendon Building with 132 beds. Two other buildings on the Crafts-Farrow State Hospital grounds will furnish an additional 120 beds when completed. These 608 beds in the Tucker Center and 418 beds in the Dowdy-Gardner Nursing Care Center have all been developed since June 1970, continuously operating at an occupancy rate above expectations.[6] During the same period, community nursing home beds have increased within the state, with increased utilization of church-related homes and general hospital beds by the elderly.

DISCUSSION

In a broader social context, the numbers of older people in America have been building for more than seventy years. This growth will continue for the next fifty years. In effect, one is dealing with an historically new phenomenon, a new population within our very midst. This is reflected in the census data which revealed that in the year 1900 only three million (4 percent of the population) were 65 and older. By 1975, twenty-two million (10%) were in this age group. By 2010, the elderly will number 33.2 million and because of the post World War II baby boom, will number 51.6 million by 2030. All of those who are going to be 65 and over in 2030 are alive today. The average life expectancy has increased from 49 years in 1900 to over 75 years in 1975. The crux of the problem lies in the gap created by rapid growth of the over-65 population and the accompanying failure to develop necessary and appropriate social structures, support systems, community services, and research and training programs to meet their needs.[7] Twice in the last five years, the federal government has had to devise "emergency" measures to save the Social Security system, which remains as the largest single source of income for the elderly.

In this country, five percent of the elderly are institutionalized (four percent in nursing homes, one percent in hospitals); the other 95 percent, that is more than twenty-three million people age 65 and older, are not in institutions but are in the community. Of the group 65 and over, five percent are institutionalized. Of the group 75 and over, 10 percent are institutionalized. Of the group 85 and over, 20 percent are institutionalized. Since many older people have special mental health needs secondary to emotionally distressing events, there is a general cost offset following outpatient psychotherapy due to the reduction of inpatient costs. Older patients generally show larger cost offsets than younger ones; the elderly use more medical services, including the particularly expensive inpatient services. Effective psychiatric treatment reduces physical complaints, tending to reduce costly diagnostic studies and

treatment. Underutilization of mental health services by the elderly results in needless suffering among the elderly and needless cost to society.[8]

CONCLUSION

Aging is a natural process much like the changing color of the leaves each autumn. It is not a disease, nor is it in itself a crisis. However, the growing number of aged individuals resulting from increased life expectancy has created a change in population ratios, presenting a crisis which urgently demands attention. □

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ALZHEIMER'S DISEASE AND LONG TERM CARE

CHARLES N. STILL, M.D.*

The concept of dementia as being out of one's mind was introduced by Aurelius Cornelius Celsus before 100 A.D., entering English essentially unchanged in 1672. In contrast, J. E. D. Esquirol redefined the term senile dementia in 1838 as "enfeeblement of memory, particularly the memory of recent impressions .... attention at first fatiguing, at length .... impossible; the will is uncertain and without impulsion; the movements are slow and impractical."[1]

SENILE DEMENTIA/ALZHEIMER'S DISEASE

Modern concepts of senile dementia now belatedly recognize the seminal work of Alois Alzheimer, who in 1906 described unique clinicopathologic features of dementia in a 51-year-old woman. Initially, she showed only slight impairment of gait, reflexes and coordination, but her condition progressively deteriorated, death occurring within five years. At autopsy, her brain was grossly atrophic, with large numbers of cortical neurons affected by neurofibrillary tangles and granulovacuolar degeneration. Numerous senile (neuritic) plaques were found throughout the cerebral cortex.[2]

Regarded as no more than an interesting medical curiosity, the disorder was named Alzheimer's Disease at the insistence of Emil Kraepelin in 1920. This laudable posthumous tribute to Alzheimer unfortunately led to overemphasis on age of onset as the basis for classifying dementia senile or presenile, despite identical brain pathology. Even worse, senile dementia was erroneously attributed to arteriosclerosis.[3] While such misconceptions doggedly persist, the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, Third Edition, commonly called DSM-III, now identifies Alzheimer's Disease as primary degenerative dementia (PDD), and arteriosclerotic dementia has been renamed multi-infarct dementia.

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Even with improved nosology, American physicians who make a clinical diagnosis of Alzheimer's Disease find that 20 to 30 percent of their cases have some other disease at autopsy. This problem has been addressed by stricter new rules for the clinical diagnosis of Alzheimer's Disease in the Work Group Report of the National Institute of Neurological and Communicative Disorders and Stroke/Alzheimer's Disease and Related Disorders Association, under auspices of the U. S. Department of Health and Human Services Task Force on Alzheimer's Disease, as shown in Table 1.[4]

Though controversy continues, most experts agree that Alzheimer's Disease is a specific diagnostic entity characterized by the insidious onset of progressive mental deterioration, accompanied by prominent disturbances of language, memory, and visuospatial recognition. Motor functions are usually spared early, though there is progressive impairment of sequential motor skills (apraxias). These apraxias eventually so impair feeding, dressing, bathing, toileting and other activities of daily living, that the patient requires assistance on a 24-hour basis, i.e. long term care in the home or in an institution.

As shown in Table 2, the natural history of Alzheimer's Disease develops according to a pattern of three consecutive and irreversible stages. Inevitably, urinary and fecal incontinence become prominent by Stage III, which characteristically shows vegetative immobility, leading to decubitus ulcers. Aspiration pneumonia and/or other intercurrent infections, particularly of the urinary tract, usually precede death.[2]

EPIDEMIOLOGY

Within the past decade, Alzheimer's Disease has been recognized as the fifth leading cause of death, annually claiming 100,000 lives from its two million victims in the United States. The toll will rise by the year 2000, when the number of Americans over age 80 will have doubled, and those over age 65 will number 36 million, or about 13 percent of the total population. South Carolina

Table 1

ALZHEIMER'S DISEASE: DIAGNOSTIC CRITERIA[4]

1. *Probable Alzheimer's Disease*

1.1 Dementia on clinical exam, confirmed by neuropsychological testing with deficits in at least two cognitive areas
1.2 Progressive loss of memory/cognitive functions
1.3 No disturbance of consciousness
1.4 Onset between ages 40-90, usually after age 65
1.5 Absence of systemic disorders/brain diseases that could wholly account for progressive memory-cognitive deficits
1.6 Progressive deterioration of specific cognitive functions such as language (aphasia), motor skills (apraxia), and recognition (agnosia)
1.7 Impaired activities of daily living/altered behavior patterns
1.8 Family history of similar disorders, confirmed neuropathologically
1.9 Plateaus in the progressive course of the disease
1.10 Associated manifestations: depression, insomnia, incontinence, delusions, illusions, hallucinations, catastrophic outbursts (emotional-physical-verbal), sexual disorders, weight loss, hypertonia, myoclonus, gait disorder, seizure disorder (late in course)

2. *Possible Alzheimer's Disease*

2.1 Dementia syndrome without other brain or systemic disorders sufficient to cause atypical dementia, with variations in onset, presentation, and/or clinical course
2.2 Dementia not resulting from other brain or systemic disorder which could otherwise produce dementia
2.3 Single cognitive deficits identified in research studies as severe and gradually progressive, without other identified causes

3. *Definite Alzheimer's Disease*

3.1 Clinical criteria for probable Alzheimer's Disease
3.2 Neuropathologic evidence from autopsy/biopsy

4. *Alzheimer's Disease Research Criteria*

4.1 Familial occurrence
4.2 Onset before age 65
4.3 Presence of trisomy-21
4.4 Coexistence of Parkinson's Disease/other relevant disorders

projects a slightly lower proportion (11.2%) of residents over age 65, or about 484,000 elderly persons in the year 2000. The risk of having Alzheimer's Disease rises with age, from about five percent at age 65 to 20 percent at age 80, being slightly more common in women at all ages. Studies in rural Mississippi disclosed severe dementia in seven percent of the total population over age 80, with dementia showing equal prevalence among blacks and whites. Medical record linkage studies in Rochester, Minnesota reported the annual incidence of Alzheimer's Disease, as 110 new cases per 100,000 persons over 29 years of age.[5] Case-control studies from medical records of persons over age 55 admitted to South Carolina Department of Mental Health hospitals showed an annual incidence of 20.8 PDD cases/100,000 residents of Anderson County; in contrast, there were 3.6 cases/100,000 residents of Horry County, where water fluoride levels exceed 4 ppm. This five-fold difference in the incidence of dementia was attributed to high affinity between aluminum and fluorides, which prevent aluminum from being absorbed and accumulated in the brain.[6]

Table 2

THE STAGES OF ALZHEIMER'S DISEASE[2]

Parameter	*Stage I*	*Stage II*	*Stage III*
Duration (years)	1-3	2-10	8-12
Recent Memory (Amnesia)	+ +	+ + +	+ + + +
Remote Memory	+ +	+ + +	+ + + +
Language	+ +	+ + + +	+ + + +
(Aphasia)	(Anomia)	(Fluent)	(Mute)
Personality	+ +	+ + +	+ + + +
	(Apathy)	(Apathy)	(Vegetative)
Visuospatial	+ +	+ + +	+ + + +
Apraxia	+	+ + +	+ + + +
		(Ideomotor)	
Motor	0	+ +	+ + + +
		(Restless)	(Fetal-Rigid)
EEG	0	Slow (Background)	Slow (Diffuse)

LONG TERM CARE

Once viewed as skilled nursing facility (SNF) care, long term care has recently been redefined as "diagnostic, preventive, therapeutic, rehabilitative, supportive and maintenance services for individuals (and their families) who have chronic physical and/or mental impairment, in a variety of institutional and noninstitutional health care settings, including the home, with the goal of promoting the optimum level of physical, social and psychological functioning."[7]

Viewing such concepts of long term care against the stark realities of Alzheimer's Disease, many physicians would revise the above definition as follows: "Supportive and maintenance services for individuals who have chronic physical and/or mental impairments, in . . . . institutional . . . . settings, with the goal of promoting the optimum level of physical . . . . functioning," particularly in Stages II and III (Table 2). Despite claims to the contrary, few patients with Alzheimer's Disease can be safely maintained in the home after Stage II has fully developed, usually after five or more years of illness. The assertion that Alzheimer patients need nursing home care only

during the last six months of life is clearly not prudent from a medicolegal standpoint. Such patients require continuous supervision to prevent serious injury or death by accidents, such as falling down stairs, ingesting toxic materials, or wandering away from home into danger. Even so, families who have the resources to provide the necessary care at home usually do so as long as they can, often at great cost to their own mental health. Nevertheless, when the patient no longer recognizes the home milieu and/or the caregivers, institutional placement should be strongly considered. The inexorable nature of Alzheimer's Disease eventually brings even the most devoted caregivers to realize that they cannot indefinitely continue to provide one-to-one home care, 24 hours each day. Early in the course, the home environment is preferable. Coordinated by a case manager, home health care, personal care and maintenance and nutritional services should be integrated with community-based services such as adult day care, senior citizen centers, community mental health, respite care, medical and protective services.[7] If the patient has no home and/or relatives, board and care facilities or retirement villages may be good options.[5] Paranoid behavior requires emergency institutional placement, usually in a mental hospital, with later transfer to a nursing home. In earlier stages of Alzheimer's Disease, associated Parkinsonism increases the risk of injury due to falling, with attendant injury necessitating hospitalization and subsequent nursing home placement.

Physicians who care for patients with senile dementia should become thoroughly familiar with the full spectrum of local resources to foster cost-effective management for those who need long term care services (See the Directory Section in this issue of *The Journal*).

RESEARCH

Primary prevention of Alzheimer's Disease depends on knowing its ultimate cause. Despite federally supported research expenditures exceeding $25 million annually, there is as yet no evidence suggesting that it is possible to prevent or to retard the inevitable progression of Alzheimer's Disease. Predictably, advocates for cholinergic therapy, neuropeptides, antiviral therapy, cerebral vasodilators, nootropics, chelation therapy and genetic engineering continue to disagree on priorities for research.[5] It is also clear that further research on systems of care, particularly long term care, is a matter of urgent national concern. The alternatives are unthinkable-economic ruin and/or mass euthanasia for the demented elderly.

Alzheimer patients now occupy about half of the 1,400,000 beds in this country's 19,000 nursing homes. Total health care costs for Alzheimer's Disease are projected to rise from $26 billion in 1983 to $750 billion by the year 2030, when more than 50 million Americans will be 65 or older. If this terrible prophecy is fulfilled, physicians will suffer with patients through another half-century of frustrating failure to conquer Alzheimer's Disease, which has truly become the Gray Plague of the 20th Century. From Celsus, the Roman physician who recognized dementia in the first century, we have learned "It is impossible to remedy a severe malady unless by a remedy likewise severe."[8] Herein lies our challenge, and our hope. □

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SCMA NEWSLETTER

July, 1986

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NEW PCF MEMBERSHIP FEE SCHEDULE ADOPTED

In order to comply with Act No. 443 of 1986 which, among other provisions, requires an annual membership fee from all PCF (Patients' Compensation Fund) members, the PCF Board of Governors has adopted the following membership fee schedule:

1st year membership fee	100% of the JUA premium
2nd year membership fee	75% of the JUA premium
3rd year membership fee	50% of the JUA premium
4th and subsequent years membership fee	40% of the JUA premium

A significant increase in the cost of professional liability coverage is reflected in the last category, into which the vast majority of PCF member physicians fall.

The JUA (Joint Underwriters Association) announced a rate increase of 30% for physicians in January of this year. This increase and the additional 40% increase noted above are "a result of the uncontrolled escalation of lawsuits against physicians and other health professionals we see in South Carolina and elsewhere," said SCMA President *Walter J. Roberts, Jr., M. D.* "We have seen family doctors get out of the business of delivering babies in South Carolina because of the growing problem of liability, and we have seen the cost of DPT vaccine go up recently from $4.29 to $11.50 per dose because of the same problem. This has got to stop or South Carolinians face the potential of having their access to health care limited."

Renewal dates for PCF members have been extended several weeks, since the renewal notices were delayed. Membership, however, will remain current during this period.

As announced in last month's *Newsletter*, the SCMA recently joined with nearly 20 other statewide business and professional groups to form the South Carolina Civil Justice Coalition to carry on the tort reform effort during the next session of the General Assembly. The objective of the coalition is to promote legislation that will put more balance into laws affecting the civil justice system in the state. The coalition members believe that those laws are now out of balance in favor of plaintiffs.

HOSPITAL DISCOUNTS

Reports are being received at the SCMA headquarters of attempts by certain payor groups to negotiate discount arrangements with hospitals. Under current South Carolina law, if a hospital gives a payor a discount, it must offer a similar arrangement to all other payors. This law was passed in 1968 and remains in force. The law also provides that any person making full payment for hospital services within seven days from receipt of the bill is entitled to the same discount allowed to any insurer. (SS 38-35-60)

LET YOUR VOICE BE HEARD!

Medicine is clearly one of the most regulated professions in the state. The officials elected this November will be responsible for initiating and implementing legislation which will directly affect the operation of your practice and the manner in which health care is delivered to your patients.

If you are not registered to vote -- if you are not a member of SOCPAC -- then you are abdicating your responsibility to affect the climate for tort reform and the outcome of other critical issues to be determined by the General Assembly in the 107th Session.

If you have not voted in two consecutive general elections, have had a recent change in residence or if you have NEVER registered to vote, you may do so at the office of your county Board of Registration or by contacting your Deputy Registrar. You must register by the third of October in order to qualify to vote in the November General Election. If you are not registered to vote, please do so as soon as possible. Your vote -- your voice -- is needed to ensure that the collective voice of the medical profession is heard in Columbia.

The South Carolina Political Action Committee (SOCPAC) is the political action arm of physicians in South Carolina. Your membership in SOCPAC enables the medical profession to assist candidates in their efforts to secure election or re-election to public office. In the elective process, many variables increase the expenses incurred by candidates seeking office. It is critical to our efforts to be of assistance in getting the message to the general public so that intelligent decisions can be made in selecting our state officers and representatives.

Many of our adversaries have political action committees with substantially higher membership dues. The Chiropractic Association, with fewer statewide members, is reported to have substantially higher dues as well as pac reserves than SOCPAC. The Trial Lawyers Association is conducting an aggressive campaign to increase membership in SCALE -- their pac. Their goal is to increase the number of trial lawyers in the General Assembly.

Your contribution of $100 to SOCPAC would be of tremendous assistance in our efforts to be heard on medical issues in the General Assembly.

PRO CONTRACT AWARDED TO METROLINA

As this *Newsletter* went to press, the S. C. Medical Care Foundation was notified that the PRO (professional review organization) contract had been awarded to the Metrolina Medical Peer Review Foundation of Charlotte, N. C. The Co-Chairman of Metrolina's South Carolina PRO Development Committee is Darryl Addington, M. D., of Lancaster. The implementation date of the contract is expected to be August 1. Further details will be furnished later.

OTHER NEWS FROM THE FOUNDATION

As a reminder, the South Carolina Medical Care Foundation performs review for Medicaid and the Medically Indigent Assistance Fund (MIAF) as well as a number of private companies in South Carolina.

Approximately 200 different outpatient procedures are subject to review when these procedures are performed on an inpatient basis. The objective of this review is to assure appropriate utilization of services.

The latest additions to the outpatient surgical procedure list are cataract extractions and lens insertions.

Medicaid and MIAF now require preadmission review of six procedures: cholecystectomy; hysterectomy; tonsillectomy/adenoidectomy; hernia repair; non-obstetric D&C if done inpatient; and knee arthroscopy if done inpatient.

Questions about the Outpatient Surgical Procedure List and preadmission review should be directed to the SCMCF Preadmission Review Analyst at 1-800-922-1840.

CANTEY RETIRES AS SCMCF MEDICAL DIRECTOR

William C. Cantey, M. D., has announced his retirement as Medical Director of the S. C. Medical Care Foundation effective June 30, 1986. Dr. Cantey assisted the Foundation as the Chairman of the Health Care Guidelines and Education Committee from 1974 to 1976 and became the Foundation's Medical Director in 1976.

Prior to 1976, Dr. Cantey was in the private practice of General Surgery in Columbia for 30 years. Long active in medical and community affairs, Dr. Cantey has served as President or other officer of numerous prestigious medical organizations, and his community activities include service as a Director of a number of financial and insurance institutions. He has also been President of the S. C. State Fair and Chairman of the Columbia Metropolitan Airport Commission. His awards include a Distinguished Alumnus Award from MUSC, the Community Service Award of the SCMA and the City of Columbia's Mayor's Award as Ambassador of the Year.

Married to the former Blanche Dennis of Darlington, he and Mrs. Cantey have two children and three grandchildren.

FASTER PAYMENT PROMISED

Responding to widespread physician criticisms that Medicare reimbursement lag time has become intolerably long and deliberate, HCFA has directed Medicare carriers to process "clean" claims within 27 days of their receipt. Clean claims are those that include all information necessary for reimbursement processing. Other claims may be kicked out for medical necessity determinations or lack of complete information.

HCFA officials said the new policy is being implemented immediately and that carriers must be in compliance by September 30. All carriers will be expected to process 90% of clean claims within the 27-day standard and to do so uniformly. William Roper, M. D., HCFA Administrator, has released $15 million from the contractor contingency fund to provide financing needed to expedite speedier claims processing. HCFA maintains there are two reasons for the widening span of time that has transpired in Medicare claims processing - budget cuts mandated by the Gramm-Rudman provisions and greater-than-expected increases in the volume of claims.

AMA INSURANCE CLAIM FORM

The AMA and SCMA wish to remind you that, effective October 1, state Medicaid agencies will be required to exclusively use and accept the AMA-developed standard health insurance claim form, "Standard Form HCFA 1500." This form, the product of extensive, years-long AMA efforts to devise and motivate usage of a "universal" form, already is required for Medicare, and has been adopted for use by CHAMPUS, the U. S. Department of Labor for Federal Workers' Compensation and Black Lung programs and by many private insurance companies.

The forms are available from the AMA at a cost of $34.10 per carton of 1,000 (OP 501); 2-part snapout (OP 502) at $49.50 per carton of 1,000; and 2-part continuous for computer printers (OP 503) at $51.75 per carton of 1,000. Prices include shipping and handling charges and AMA members receive a ten percent discount. Direct inquires and orders to AMA Insurance Form, Book and Pamphlet Fulfillment, AMA, PO Box 10946, Chicago, IL 60610.

CAPSULES....

James F. Hicks, M. D., is the additional SCMA appointee to the Appalachian Health Council Primary Care Study Committee, and *C. M. Meares, Jr., M. D.,* has been appointed to the DHEC Family Planning Advisory Board representing the SCMA....

....*James W. Stands, M. D.,* will represent the SCMA on the DHEC Lay Midwifery Board. At the request of the Governor, the SCMA has submitted the following nominees to the Council on Maternal, Infant and Child Health. *John B. Johnston, M. D., E. J. Dennis, M. D., and Sharon S. Ellis, M. D.*

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LAMM'S DILEMMA: A DUTY TO DIE?

NORA K. BELL, PH.D.*

"Like leaves which fall off a tree forming the humus in which other plants can grow, we've got a duty to die and get out of the way with all of our machines and artificial hearts and everything else like that so that the other society, our kids, can build a reasonable life."[1]

With these words, spoken during an address to the Colorado Health Lawyers Association in Denver in March of 1984, Colorado Governor Richard Lamm sparked a controversy that touches on one of the most sensitive issues of our time: the question of caring for gravely ill elderly patients.

On the heels of Governor Lamm's infelicitous remark, the prestigious *New England Journal of Medicine* published a report recommending guidelines for making life-and-death decisions for such hopelessly ill patients. These guidelines were advanced by several nationally prominent physicians in attendance at a meeting at the Harvard Medical School. Among those proposing the guidelines was Dr. Daniel D. Federman, former president of the American College of Physicians.

Acknowledging that, in general, physicians in such a situation ought to defer to their patients' wishes, the guidelines did nevertheless suggest that it is ethical to withhold drugs and, sometimes, food and water from mentally incapacitated elderly patients who are hopelessly ill, so long as they are kept comfortable while they die. Specifically, they suggest that, "If a patient rejects food and water by mouth, it is ethically permissable to withhold nutrition and hydration artificially administered by vein or gastric tube. . . . Severely and irreversibly demented patients need only care given to make them comfortable."[2]

Such statements understandably upset a substantial segment of our population, namely the elderly, and Lamm's remark led Claude Pepper, the leading Congressional advocate for the elderly, to accuse Lamm of "downgrading the elderly."[3] Although Lamm's remark was, I believe, misunderstood because it was misspoken, it has gotten so much play in the press that it bears looking at a little more carefully.

Exactly what might it mean to say that one has a "duty to die"? Such talk raises some curious ethical and philosophical issues.

Frequently, when one talks of duties it is done in contexts where duties are said to have correlative rights. On such a view, if I have a duty to help those in distress, for example, then an individual in need has a right to expect such help from me, or from all comers if the duty is universally binding.

Such duties and rights are thought to arise bilaterally, that is, within contexts that confer rights and generate duties at the same time. So, for example, if I promise X to Y, I confer on Y the right to expect that I will perform X, and I generate an obligation on my part to perform as promised. Contracts represent the legal counterpart of such a conception of rights and duties.

Others argue, however, that there are at least some duties which seem to have no correlative rights — the duty of charity is the example they cite most frequently. Those who argue this position would hold that while I might have a duty to help individuals in need, they have no right to expect that I will.

Furthermore, just as there are various kinds of rights, say, legal rights, moral rights, human rights, and so on, moral theorists distinguish several analogous kinds of duties, in particular, legal duties and moral duties.

Certainly, Governor Lamm didn't mean that individuals have a legal obligation to die when gravely ill, or when faced with a diagnosis of a terminal illness. One could only have a *legal* duty to die if laws had been enacted specifying such an obligation. Governor Lamm also obviously didn't conceive of the duty to die as the obligation-correlate of a human right. What he did intend to suggest, it seems plausible to say, is that one's duty to die, if we grant that individuals have such a duty, is a *moral* duty.

It also seems clear that he didn't intend that it be understood as a duty without a correlative right. That is, we were given to understand by his

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remark that those of us who are not old and/or hopelessly ill do have a right to expect that others will fulfill their obligation to become the "humus" in which we can grow.

But if one has a duty to die when old or infirm, does that mean that others have a right to *insist* upon one's dying now, or that others have a right to "help him on his way"? If one has a duty to die, is he obliged to end his own life when he becomes old and/or gravely ill? Is one obliged to secure others who will "help her along" if she fears that she will be unable to do it herself? Should physicians and nurses assist patients and family members in fulfilling the "duty to die"?

In 1983, the New Jersey courts examined a case where feeding was withdrawn from a hopelessly ill and "deranged" patient.

The nephew of an elderly, mentally incompetent nursing home patient, Clair Conroy, 84, sought court authorization for removal of her nasogastric feeding tube. The patient suffered from severe organic brain syndrome as well as several physical problems, including diabetes. She was not, however, terminal. Unable any longer to care for herself, she had been admitted to the nursing home in 1979. Nasogastric feeding had been initiated in July 1982.

The lower court authorized cessation of feeding by tube, acknowledging as it did that the tube's removal would "almost certainly lead to death by starvation and dehydration within a few days," and noting that "her death may be a painful one."[4] This lower court order was stayed pending appeal; however, Clair Conroy died of natural causes thirteen days later.

Regardless, the appellate court chose to rule in the matter, believing that the case spoke to matters of great public concern. In reversing the lower court order, the appellate court ruled that one could not discontinue life-sustaining treatment solely because an individual was of severely impaired mental capacity.

Clearly, the reasons for the court's dictum that any decision to remove life-support treatment "should be limited to incurable and terminally ill patients who are brain dead, irreversibly comatose or vegetative, and who would gain no medical benefit from continued treatment"[5] are obvious: conventional or traditional morality recoils at the thought of making dangerous "quality of life" determinations. The presumption in favor of the patient's humanity should *not* be rebuttable if the patient is nonterminal, even though he or she might be severely mentally impaired. "Quality of life" is a vague and troubling phrase, inviting unfortunate comparisons and unavoidable bias. The court chose to suggest that determinations involving estimations of the worth of the remainder of one's life were inappropriate and immoral.

It was this notion, namely, that Lamm and others would presume to make estimations of the value of the remainder of their lives, that angered and aroused the elderly and their advocates.

Yet it is sometimes true that the prospects for successful treatment of a gravely ill patient are so remote, and the accompanying damage so great that there are times when one might say that a rescue is not obligatory. "We may step aside, sadly, but with good conscience."[6]

In *Barber v. Superior Ct.*, for example, a court refused to hear murder charges against two physicians who not only disconnected the respirator of a comatose and brain-damaged patient, but then stopped IV feeding. The patient died six days later.

Saying that "a physician has no duty to continue treatment once it has proved to be ineffective," the decision further argued that the decision to remove the IV "though intentional and with the knowledge that the patient would die, was not an unlawful failure to perform a legal duty."[7]

But, although discussions such as this have been stimulated by Lamm's remark, and although it is important and productive to look at an ethical issue such as this, the original intent of Lamm's message, I think, was different. He intended, it seems clear, to call attention to the fact that medical techology is increasingly replacing divine intervention in deciding when one dies.

We can prolong lives sometimes indefinitely, but at what price? Perhaps Lamm's statement was less an endorsement of euthanasia than it was an attempt to act as advocate for what used to be called "death with dignity," that is, a plea for society to recognize one's "right to die" without medical science intervening.

How often anymore do we hear physicians refer to death as occuring from "natural causes"? Because medical technology has given health professionals the capacity to extend and prolong life, many of them feel both legally and morally obliged to do so. The legal problems involved in

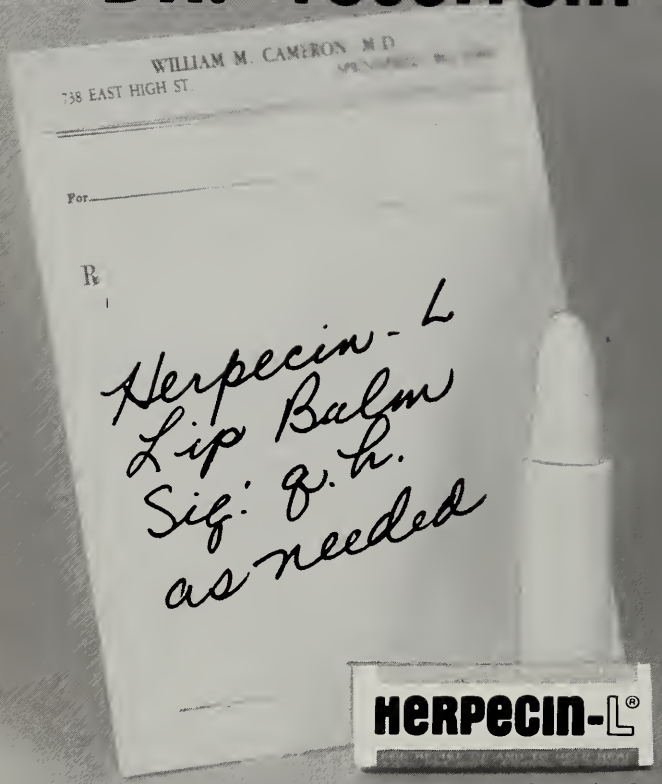
allowing elderly patients to die at their own request have created legal and moral dilemmas for physicians, nurses and hospitals. Often, even with so-called "living wills," medical facilities insist upon having court orders before they will comply with patients' requests to be disconnected from sophisticated electronic gadgetry.[8]

The dilemma with which Lamm intended to confront us is probably better expressed as an attempt at understanding the moral maxim, *primum non noncere* — "first, do no harm." Do we do more harm in continuing to treat against patients' and families' wishes or more harm in recognizing the right to die with dignity? Unquestionably, we do harm if we halt the feeding of one who is old and/or helpless, and dependent upon our continued care. What Lamm wanted to suggest, it seems, is that we also do harm in forcing life on those who have stipulated that they no longer want life extended artificially. □

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THE TEACHING NURSING HOME

SHAWN A. CHILLAG, M.D.*

MEDICINE AND AGING

Gerontology (the study of aging) and geriatrics (the health care of the aged) are assuming increasing importance in medical education. A survey of 125 medical schools in the United States showed that 80 have at least some program of geriatric education for medical students and housestaff. In 1977 fewer than 700 physicians in the United States were doing a significant amount of work dedicated to geriatrics. This was at a time when 7,000 were needed.[1] Now 10,000 are needed.[2]

One reason for medicine being pushed and shoved into geriatrics is the "demographic imperative" of our rapidly aging population.[3] Every day 4,000 Americans turn 65; every day 3,000 over 65 die; every day there are 1,000 more "elderly." Half of all people who have ever reached age 65 are now alive.[2]

NURSING HOMES

Nursing homes have developed in the last 50 years. The Social Security Act of 1935 denied payments if the recipient resided in a public institution so these people moved into private homes. By the 1940's these boarders were older, and nurses were hired. The family operated nursing home was born.[4] The sixties brought Medicare and Medicaid, and nursing homes became big business.

Currently six million people in the United States need long-term care assistance. If present patterns continue, this number may rise to nine million by 1990. One third may need nursing home care; one third will need long-term assistance at home; and one third will require some institutional service.[5]

The *nursing home* population could double the 1980 levels by 1990.[6] Currently there are 1.4 million people occupying nursing home beds in nearly 19,000 nursing homes. Eighty percent of nursing homes (70 percent of the beds) are proprietary.[4] At any one time, five percent of those over age 65 are in nursing homes. However, 20 percent of those over age 65 will be in a nursing home at some time. The average nursing home resident is over age 80. Twenty to 25 percent of those over age 85 (the fastest growing segment of our society) are in nursing homes.

Table I
AGING FACTS

— 1,000 more people over age 65 daily
— over 11% of U. S. population is over age 65
— 1.4 million people are in nursing homes (NH)
— 20 percent of those over 65 spend some time in a NH
— 20 percent or more of those over 85 are in a NH
— 20 percent of those in NH die each year
— NH costs of $42 billion in 1985; $75 billion by 1990
— 50 percent of Medicaid dollars for NH

Most patients in long-term care institutions are women. (80 percent of women greater than 75 are widows).[7] Part of the preponderance of females in most nursing homes is explained by the 1990 projection that veterans will comprise 60 percent of all American men over age 65.[8] The Veterans Administration Nursing Home Care Units (NHCU) siphon away many males from proprietary homes. The average age NHCU resident is 75, with an average length of stay of 5.3 years.

Given the same health status, persons with no family living in their community are much more likely to end up in a nursing home. Fully 50 percent of nursing home residents have no first-order relatives in nearby communities. Of those elderly not in institutions, only 29 percent live alone.[9] Seventy-five to 80 percent of nursing home residents remain in the nursing home until death. Eventually 15 percent are rehabilitated and return home. Four percent are rehabilitated sufficiently to be moved to less specialized care.[10] Twenty percent die each year. Those in nursing homes have few alternatives, and nursing homes are very expensive.

OVERVIEW OF COSTS

The monies involved in the care of the elderly are enormous and much of elderly health care

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dollars are for nursing home care. Public funding pays for 88 percent of acute hospital care for the elderly and 57 percent of the nursing home bill.[9] The diseases of the elderly patient are chronic; the elderly person who is a patient averages four chronic disease diagnoses. But the message of Medicare for the average patient is, "Get well fast or get lost."[11]

Health care costs for nursing homes amounted to $10 billion in 1975, rising by 50 percent in 1976. The anticipated cost for nursing homes is $42 billion in 1985 with an expected increase to $75 to 90 billion by 1990![1, 4, 6, 11] Much of Medicaid funds — 50 percent or more — go for nursing home costs. Personal savings pay up to 50 percent of nursing home costs for the person who is not eligible for Medicaid.[5] In 1980, private insurance paid only 0.7 percent of nursing home costs.[5] The numbers of people and the resources involved mandate more physician involvement in gerontology and geriatrics.

MEDICAL EDUCATION AND GERONTOLOGY GERIATRICS

The Institute of Medicine (IOM) report from the National Academy of Science in 1978 concluded that gerontology and geriatrics were given insufficient attention in medical schools and residency programs.[12] The IOM concluded that there is no unique body of geriatric knowledge like oncology or neurology that requires a specialty designation, but there is a body of knowledge that is in need of an advocate in an academic center of any size.

Students, residents and practitioners have expressed a desire for a greater knowledge of aging. Every area of medicine except pediatrics can benefit from geriatric education. The Institute of Medicine committee recommended training in the biologic sciences, psychosocial aspects of aging, clinical aspects of aging, and health services and financing.[9] Eight to ten thousand more physicians trained in geriatrics are needed to deliver care to the frail elderly.[4]

Prior to medical school, students have positive attitudes about working with elderly people, but these attitudes usually change.[13, 14] If students only encounter old people who are doing poorly, it is difficult to maintain their enthusiasm. The first old person they usually meet is their cadaver.

Many foundations (Robert Wood Johnson, W. K. Kellogg, Beverly) and the National Institute on Aging are funding programs to support and to improve geriatic education.[6] Most of the programs are based in departments or divisions of internal medicine. There is one geriatric department with a dedicated basic science and clinical curriculum. There is powerful pressure within and without the medical community to teach more about aging and care of elderly. Eisdorfer identified one of the key problems in medical education when he said, "students come to medical school with the highest of social values but emerge into practice idealizing the high technology, and one of the narrow foci enshrined in the hospitals where they were trained."[14] If properly presented, the teaching of geriatrics can do a lot to rectify this problem.

MEDICAL EDUCATION AND THE NURSING HOME

There is much written about how best to teach geriatrics. The nursing home is the key institutional base in many programs.[1] All nursing homes have a wealth of clinical material but in a real sense many nursing homes are a Devil's Island, a place of no return. Some positive outcomes are needed if the enthusiasm and interest of trainees, staff and faculty are to be maintained.

Education is expensive; private nursing homes will not support education if there is an alternative. If prospective payment as with diagnosis related groups (DRGs) includes the nursing home, housestaff programs and private nursing homes will be incompatible. To provide a learning environment, the nursing home should be subsidized for education by outside sources in some fashion. It should also emphasize rehabilitation for as many of its patients as possible. The first point has been partly addressed by the Veterans Administration teaching programs with Nursing Home Care Units which have a vested interest in subsidizing geriatric education. The second point necessitates that the teaching nursing home act much like a long-term care hospital with outreach services.

The teaching nursing home program must seek to improve the lot of its inhabitants. The goal or outcome may be to return home or simply to become more independent within the nursing home. Fifty percent of nursing home occupants are demented. Constant exposure to demented, failing and dying octogenarians can squash the idealism of the young trainee. The student and house officer need to learn the techniques and experience the satisfactions of helping stroke vic-

tims overcome disability and return home. DRGs may push long-term rehabilitation and convalescent patients out of hospitals and into nursing homes. The nursing home can be a place for respite care to relieve families caring for an impaired elderly person. A two week vacation for the family may save fifty weeks' nursing homes costs. The nursing home is an important but not an exclusive part of geriatric training.[15]

The ideal geriatrics environment should be a multi-faceted program that includes the classroom, acute hospital, outpatient department, day hospital, home care, community projects with well people, rehabilitative services and the nursing home.[7, 12] The cognitive base is readily communicated in the classroom. This fund of knowledge alone has not been shown to maintain positive attitudes about caring for the elderly. Rather, rewarding interactions with elderly people and preceptors who demonstrate a caring attitude for their older patients is twice as effective at maintaining positive attitudes as is a cognitively oriented program.[13, 16]

Acute hospitals and outpatient departments provide a wealth of clinical material. Day hospitals have as a prerequisite a good transportation system. Where available, day hospitals offer a less costly alternative to rehabilitation and long term specialized diagnosis and therapy. Home visits are critical for the trainee. For the uninitiated, a home visit can provide an eye-opening, even an eye-popping amount of insight into the problems of growing old in America. The coordination of all these efforts necessitates an understanding of financing and services available for the elderly person. A team effort is required.

The chronically and multiply impaired elderly patient has needs that are beyond the scope of traditional medical practice.[10] For the most part, the physician will not and should not direct these multidisciplinary efforts. The medical doctor, as a leader of a multidisciplinary team, tends to "overmedicalize" the system.[10] The best case manager for coordination and integration of resources, services and personnel is not the physician. The trainee can benefit from working as a subordinate team member. The physician can strongly exercise the more traditional role of the physician as the primary patient advocate.

SUMMARY

When I first became interested in geriatrics, it was for scientific medical reasons. Geriatrics is the ultimate in sleuthing. It is the atypical presentation of common diseases; it requires the artful diagnostician, it necessitates the juggling of the treatment regimen with the diminished reserves of organs and systems. As examples, the relatively high incidence of Listeria meningitis, the cryptic presentation of hyperthyroidism, the altered pharmacodynamics, the frequent presence of difficult-to-treat depression, and sensitivity to extremes of temperature are challenges to keep the scientific interest of anyone kindled. But what quickly becomes apparent is that high quality care is not possible without close attention to the social and ethical aspects of care of the older person. It is at times overwhelmingly burdensome to look after sick, infirm, isolated, neglected, poor old people. It takes a team effort as much as in any other area of medicine. The physician can best learn to be a team member by seeing all aspects of care — hospital, outpatient, home and nursing home. □

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NEW NATIONAL VIEWS OF COMMUNITY LONG TERM CARE*

JOHN AMSON CAPITMAN, PH.D.**

The highly successful South Carolina Community Long-Term Care Project (CLTCP) was one of 13 demonstrations included in the national evaluation of Medicaid 1115 and Medicare 222 waiver projects of coordinated community-oriented long-term care sponsored by the Health Care Financing Administration.[1]. The CLTCP model is being expanded statewide under Medicaid 2176, home and community care waivers. These demonstrations sought to improve the cost and service effectiveness of publicly sponsored long-term care through case-management of expanded community based services. The waivers permitted expansions in the range of community care options covered by Medicaid or Medicare and in the range of individuals eligible for these services. More recently several other large scale publicly sponsored efforts are attempting to build on the experiences of the HCFA demonstrations. Planners and practitioners in South Carolina may gain a better perspective on CLTCP by comparing it to other community care efforts. In the following, I will discuss CLTCP in relationship to the other coordinated community-oriented long-term care demonstrations and new initiatives. I conclude by suggesting some additional areas for further policy and program development in South Carolina.

COMMUNITY LONG-TERM CARE DEMONSTRATIONS AND CLTCP

The South Carolina CLTCP was built on a critical appraisal of earlier community long-term care efforts and careful analysis of the unique context of the state. As such, CLTCP shared many programmatic goals and features with the other HCFA sponsored community-oriented long-term care demonstrations. It also differed from the majority of the programs in important ways. Major similarities included the following:

1. All projects assumed that by increasing the availability of Medicaid and/or Medicare support for community-oriented long-term care that the use of traditionally covered services (and in particular hospital and nursing home care) could be altered. Further it was assumed that costs associated with provision of the new services would be offset by cost savings associated with reductions in traditional care use.
2. All projects assumed the need for Medicaid or Medicare coverage of paraprofessional home care services (i.e. personal care, homemaker, etc.) to fill services needs associated with disabilities in the activities of daily living, instrumental activities of daily living and cognitive functioning. Such services were the most highly prescribed of the waivered services in all programs.
3. All projects assumed the need for case-management as an administrative and clinical service that conducts client movement through the long-term care system, while integrating informal and formal sources of care whenever possible. In all programs, comprehensive assessment and re-assessment, care planning, service arrangement and interim monitoring and counseling were provided through case-management systems.

However, CLTCP differed from other projects in important respects, including the following:

1. Only one other project (ACCESS of Monroe County, New York), used pre-admission screening of nursing home applicants as the mechanism for client identification. In the remaining projects, clients were referred because of functional disabilities and apparent services needs that placed their independent

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° Some information for this discussion is drawn from the "National Evaluation of Coordinated Community-Oriented Long-Term Care Demonstration," U. S. Department of Health and Human Services, Health Care Financing Administration, Contract No. 500-80-0073 to Berkeley Planning Associates. All opinions expressed are those of the author.

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community tenure in jeopardy. While some other projects served clients with high levels of functional disability and with multiple chronic diseases, only the pre-admission screening projects served clients with real short-term risk of nursing home placement.

2. Only South Carolina expanded eligibility for regular Medicaid and the new services to individuals who otherwise would have been eligible for Medicaid coverage only in a nursing home. A co-payment was required for these individuals in the Medical Assistance Only (MAO) category. This removal of nursing home use incentive for individuals with incomes just above the Medicaid level is now being explored in other Medicaid 2176 waiver programs.
3. The South Carolina demonstration prescribed waivered services to about half of the participants diverted from nursing home care, while waivered services were prescribed to essentially all participants in the other projects. Further, the intensity and costliness of the waivered service packages were far lower than in other demonstrations. This pattern was also associated with greater maintenance of informal caregiving by family members and friends than in other projects. Apparently, CLTCP clinicians were successful in building community long-term care on the foundation of informal caregiving and applying the individual cost-cap on community care.
4. All of these factors, combined with the unique commitments and skills of CLTCP staff, produced the only demonstration among 13 that represented a break-even situation with regard to public costs while stimulating the use of community care as an alternative to nursing home care. In all other projects, the provision of case-management and expanded community services appeared to increase rather than constrain the growth of public expenditures.

CLTCP AND OTHER MAJOR LONG-TERM CARE INITIATIVES

Beyond the Medicaid 2176, home and community-based waiver programs, three other major public initiatives in the financing, delivery and reimbursement of long-term care are relevant to the context and future of community long-term care in South Carolina. These are the National Channeling Demonstration, the Social/Health Maintenance Organization Demonstration, and state efforts to change reimbursement approaches in long-term care. Each of these efforts will be described briefly and their relevance to South Carolina will be noted.

Channeling: Established in 1980 by the U. S. Department of Health and Human Services, the National Long-Term Care Demonstration[2] is assessing the impacts of a case-management approach involving a central point of intake, multidimensional assessment and ongoing service arrangement and monitoring. Two models are being considered: a basic channeling model that only provides case-management of existing services and a financial control model that allows for expanded coverage of community services as in CLTCP but through pooling of a variety of federal and state funding sources. In this second model there are aggregate and client specific expenditure caps as well as client cost sharing requirements.

Unlike CLTCP, Channeling clients are referred to the program based on functional criteria and presumed risk of nursing home placement. The program does not provide pre-admission screening of nursing home applicants; thus it is more like the other early HCFA demonstrations than CLTCP. The evaluation of Channeling will be completed in 1986. Because of stricter admissions criteria, results are anticipated to be more favorable than in the HCFA demonstrations that used this freestanding case management agency approach. It appears unlikely that Channeling will offer an alternative to the pre-admission screening based model for control of nursing home use. It may offer a model of Medicare or combined Medicare and private long-term care insurance[3] funded community care services targeted toward those with less short-term risk of nursing home placement and greater financial resources than those clients served by CLTCP.

Social/Health Maintenance Organization: The Social/Health Maintenance Organization (S/HMO) demonstrations are just beginning in four sites across the nation. These programs expand on the reimbursement and organizational features of health maintenance organizations by extending coverage to long-term institutional and community services. Client co-payment is required, though Medicaid programs may cover this for

indigent participants. Like Channeling, S/HMO may be particularly important as a model for caring for those individuals who do not yet meet Medicaid nursing home admissions criteria, though a sizable proportion of participants in each site must be similar to those at the ICF/SNF level of care. S/HMO is particularly relevant in South Carolina and other states since it will demonstrate alternative financing and delivery approaches that encourage efficient service production and service prescription; it focuses on prevention, rehabilitation, and increased provider control over the delivery system. The evaluation of S/HMO due in 1988 may indicate how well this model can be integrated with the existing Medicaid supported long-term care system.

Alternative Long-Term Care Reimbursement Approaches: There has been increased awareness in recent years of the heterogeneity of the nursing home population. Nursing home residents have been shown to be diverse with respect to length of stay, diagnosed health conditions, rehabilitation potential, intensity of nursing requirements and outcomes of care. Several states are introducing new reimbursement approaches for nursing homes based on the concept of case-mix.[5] These approaches reimburse facilities based on individual or averaged intensity of nursing requirements, usually on a prospective basis. The approach assures access to nursing home care for indigent patients with heavy care requirements, and is expected to provide incentives for efficient production. Robert Kane and his colleagues have suggested that reimbursement approaches could also provide incentives for improving the quality of care by adjusting payment levels based on outcomes.[6] Considerable empirical work is still required to establish the basis for such quality incentive payments and associated administrative procedures. It is also necessary to develop means by which nursing home reimbursement can provide incentives for timely discharge and appropriate use of alternative community services for those patients for whom discharge and community care are possible.

FUTURE DIRECTIONS: DEVELOPING A COMPREHENSIVE LONG-TERM CARE SYSTEM

While CLTCP and its statewide expansion offer a model for cost-effective substitution of community for institutional care, the directions of newer national long-term care initiatives suggest additional work that must be done. In effect, CLTCP provides an approach within the context of traditional fee-for-service reimbursement for constraining the growth of Medicaid supported long-term care. It does not provide solutions to the long-term care needs of individuals with less than ICF/SNF level service requirements, or for those whose income and assets are above the MAO level. Both Channeling and S/HMO may provide models for serving these populations. While the program was efficient in service prescription and built long-term care on the foundation of informal caregiving, it did little to affect the efficiency of providers, the quality of the care that they offered or the timeliness of institutional discharges. The new Medicaid institutional reimbursement approaches and S/HMO may provide a basis for addressing these concerns. In summary, while the program tackled major problems in the long-term care system, it did not attempt to develop a fully comprehensive long-term care system.

A comprehensive long-term care system would mix public and private resources for providing appropriate care to all segments of the growing and heterogeneous aged and disabled population. It would be cost-effective and predictable compared to the current system for public payors, while giving the providers of care greater freedom in delivering high quality services in the most efficient fashion. A comprehensive system would also be accessible, responsive, efficient and affordable for consumers. Greater partnership between public payors and consumers in financing care would be achieved, and public sector roles would be expanded to include the monitoring of long-term care insurance carriers and other approaches to pooling of consumers' resources in financing and delivering care. Public reimbursement approaches would also change to strengthen the reimbursement system as a mechanism for assuring efficient production of all services and timely movement between various levels and locations of care provision. The full range of service needs including housing and community participation would be recognized and more attention would be focused on educating and supporting informal caregivers.

CLTCP presents an important first step in moving toward such a comprehensive system, and the data generated by the demonstration and the

statewide program should provide necessary information for new program developments. This successful approach was based on applying the lessons of earlier community care approaches to the unique context of South Carolina. By following the development of new long-term care initiatives, practitioners and planners in South Carolina should be able to adapt their strongest features in creating a comprehensive long-term care system. □

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POLICY ISSUES IN LONG TERM CARE: A MODEL OF TRANSITIONS

ERIC PFEIFFER, M.D.*

Policy issues in long-term care are increasingly becoming a priority for many of the states and for the nation as a whole. This is so because of a number of factors which characterize long-term care, including especially demographic factors, human factors, and financial factors.

THE DEMOGRAPHIC IMPERATIVE

The absolute number and the proportion of elderly persons in the United States is growing rapidly, including an especially rapid growth of the very old, those individuals age 75 and over, a subsegment of the elderly population particularly at risk for long-term care. Nowhere is this growth more evident than in the State of Florida.

Florida is the state with the highest number of elderly in the United States. In 1980 there were 2,252,227 persons aged 60 and over in Florida, amounting to 23 percent of the state's total population of 9,739,992. In the four-county area in which the University of South Florida Medical Center is located (Hillsborough, Pinellas, Pasco, and Manatee Counties) there were 487,539 persons aged 60 and over, amounting to 28 percent of the four-county population of 1,717,934. In three of the four counties (Pinellas, Pasco and Manatee County) this proportion ranges from 34 percent in Manatee to 41 percent in Pasco County, according to the 1980 census figures. These data constitute a *demographic imperative* to examine the long-term system serving the elderly, with a special emphasis on examining policy options available to the state and to the nation.

THE HUMAN IMPERATIVE

A second reason for focusing specifically on health and long-term aspects of elderly persons is the fact that the health care needs and the health experiences of older persons differ markedly from those of young and of young adult persons. The specialty- and subspecialty-oriented health care system now in existence is not geared to the long-term care needs of the elderly. In addition, elderly persons often require systematic integration of health and social services in order to allow them to continue to function independently despite some chronic physical and/or mental disorder. The development of a long-term care system which integrates health and social services specifically geared to older persons constitutes the *human imperative* for examining policy options in long-term care.

THE FISCAL IMPERATIVE

A third major and most persuasive factor which rivets our attention on examining policy options in long-term care expenditures for the elderly is alarming to resource allocators and health care providers alike. For instance, the cost of nursing home expenditures, some 85 percent of which is for older persons, has risen from seven billion dollars in 1973 to 18 billion dollars in 1979, but more significantly, is expected to rise to 76 billion dollars per year by the year 1990. There is therefore also *a fiscal imperative* for reexamining our approaches to health and long-term care for the elderly.

A DEFINITION OF LONG-TERM CARE

In order to keep our discussion on common ground and in order to avoid misunderstanding, it will be useful to offer a definition of long-term care. Long-term care is the entire system of health and social services necessary for those individuals who as a result of chronic physical and/or mental illness are experiencing decreased capacity in self-care. Long-term care includes preventive, educational, administrative, home-delivered, office or hospital-based, day-care or respite care and importantly, but not exclusively, institutional care of individuals with impaired capacity for independent living due to chronic physical and/or mental disorder.

A DEFINITION OF POLICY ISSUES

It is equally important for us to have a common

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understanding of what is meant by a policy issue. In our view, a policy issue is a statement of a perceived problem to which a number of differing approaches or solutions can be applied, and whose merits or impacts can be evaluated somewhat in advance of actually embarking on a specific course of action. Policy issues address entire classes of individuals, that is, aggregates of individuals, rather than a simple individual.

A DEFINITION OF A MODEL

It has taken this author a considerable amount of time to understand the nature of models. He assumes he is not unique in having this difficulty in understanding what a model is or what it does. Having labored towards an understanding of the nature of models, I would here like to attempt a definition of a model, and then go on to illustrate the function of models, with two specific examples. In our view, a model is a graphic or visual presentation of either an existing or an as yet to be developed pattern of activities or programs. A model, in general, helps us to visualize how the elements of a system interact with one another.

TWO RELATED POLICY ISSUES IN LONG-TERM CARE: PRE-NURSING HOME ASSESSMENT AND COMMUNITY CARE FOR THE ELDERLY

There are two very important policy issues with which, in one form or another, all of the states and the nation as a whole are currently actively concerned: (1) Pre-Nursing Home Assessment and (2) Community Care for the Elderly. I am not here speaking of any specific state's program in pre-nursing home assessment or specifically of the Florida Community Care of the Elderly Program, but rather the generic issue of diverting from expensive nursing home care those individuals not absolutely requiring nursing home care and the development of community alternatives for those individuals so diverted.

A MODEL OF TRANSITION

I would now like to present to you a fairly comprehensive model of transitions from one state of well-being to another for older persons in general, including both the poor (or Medicaid recipients) and the non-poor elderly. The model addresses two issues, but does so in a much broader context of looking at all the possible well-being states of all the elderly rather than focusing on only poor elderly in nursing homes. The model encourages examination not only of individuals in a specific care setting or at a specific level of well-being but focuses specifically on the factors influencing *transitions* from one care compartment to another, from one state of well-being to another, *and back*. It asserts the interdependence of program activities at all levels of care, and shatters the illusion that we can deal separately with only the poor elderly or only the poor elderly in nursing homes, and so on. Let us now examine the model.

To date, the greatest amount of public attention has been focused on what is GATE A in the model, the transition from community care to nursing home care for the poor elderly, for understandable reasons: Medicaid payments for nursing home care constitute the single largest and potentially controllable expenditure of public dollars in the entire system delineated by the model. Most states who have attempted to control this transition point have sought to erect barriers at GATE A, including the State of Florida. What we discovered was that only one-third of individuals entering the Medicaid/Nursing Home compartment entered via GATE A while fully two-thirds entered via GATE E, an almost totally unexpected finding. These latter two-thirds were individuals who were originally admitted to the Medicare and Private Pay Nursing Home compartment but who, after exhausting either their Medicare eligibility or their private resources, made application for Medicaid coverage of their continuing nursing home care. In other words, they were *already in nursing homes* when they applied for Medicaid coverage of nursing home care! The program was in effect for two-thirds of

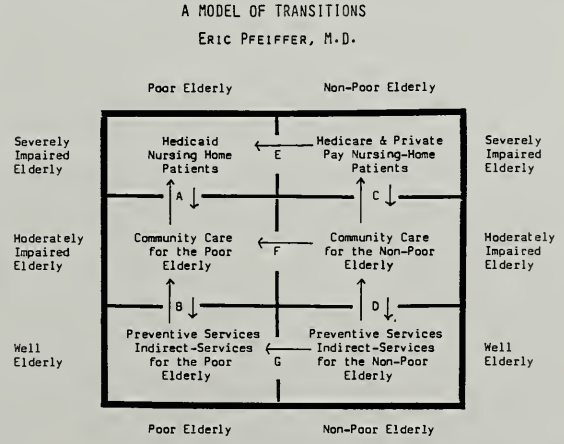


FIGURE 1. A MODEL OF TRANSITIONS

the clients, *a post-nursing home assessment program*, not a pre-nursing home assessment program! While the program was set up to slow the flow of patients into the Medicaid Nursing Home compartment at GATE A, there was a *veritable and uncontrollable hemorrhage* into this compartment by way of GATE E! Moreover, diversion of such persons who had resided for six months or more in a nursing home had dissolved family connections, given up dwelling units and expended resources so as to make a return to community living virtually impossible.

What conclusions are to be drawn from this experience, which validated our little model for us and for many other persons in this field? I believe that the most logical conclusion to be drawn is that we must be attentive to factors influencing transition at *all the transition points*, or gates, as indicated in the model. With respect to entry into the two nursing home compartments outlined in the model, we came to the conclusion that any pre-nursing home assessment program needs to consider erecting barriers not only at GATE A but also at GATE C; in other words it needs to apply to all individuals who either are now or will be at some foreseeable time in the future (six months, one year, etc.) eligible for Medicaid payment of nursing home care.

Another critical factor for a careful analysis of individuals traversing the various compartments of this model is the availability of a sufficient range and quantity of community-based services: whether individuals who are impaired but who on the basis of careful assessment do not require full institutionalized care, can in fact, rather than in theory only, be maintained in the community? This applies to both the range of services as well as the quantity of services (e.g., no day care is available; only X number of units of homemaker services are available but Y units are needed). This is obviously why we have tied the two policy issues of pre-nursing home assessment and community care for the elderly so closely together, as have a number of the states, both in the Southeast and elsewhere.

I want to make one additional point about transitions at GATE A and at GATE C. The point is a somewhat tentative one, since we do not yet have firm data to buttress this assertion. The contention is that the aggregate cost of erroneously admitting a relatively mildly impaired individual to a nursing home is vastly greater than when one erroneously admits a relatively severely impaired person (who could still be cared for on a community basis). The reason for this is that, on a group basis, mildly impaired persons erroneously admitted to nursing homes will reside there (and comsume public dollars) for long years (at a cost of about $18,000 per year at current rates) while moderately or severely impaired persons erroneously admitted will reside there for only a matter of months or short years, with a large differential in public cost. This is due to the differential in life expectancy based on impairment level.

These comments further emphasize the interrelatedness of the various compartments of the model, as least in two directions. First, they highlight the enormous importance of reliable, valid and relevant assessment procedures in determining the well-being status of older persons. In this regard the work of this author in developing the original OARS methodology of assessment (1) and the more recent work on a shorter version of the OARS, the Functional Assessment Inventory methodology (2-4) can be cited. Suffice it to say that a user-proven, user-friendly, reliable, valid and relevant assessment methodology is absolutely the key to assuring the most appropriate transitions within the model.

The other issue which derives from the model relates to those factors which influence transitions at GATE B and GATE D. Essentially, we are speaking here of preventive factors; those factors which make it possible to maintain good physical and mental health and totally independent functioning in the community. □

PLANNING FOR THE LONG TERM CARE SERVICE NEEDS OF SOUTH CAROLINA'S ELDERLY CITIZENS

ROBERT S. JACKSON, M.D.*

THE SOUTH CAROLINA COMMUNITY LONG TERM CARE PROJECT

When I came to South Carolina in 1979 as Commissioner of the Department of Health and Environmental Control, one of the first duties I became aware of was my membership on the Long Term Care Policy Council. This Council was formed through legislative action to plan and to administer the Community Long Term Care (CLTC) project. The Project was designed to test case management and home and community based services provided through Medicaid to determine their impact on the Medicaid eligible long term care population and the State's Medicaid cost. Additionally, the Council was charged with the responsibility for developing and recommending policy changes to the State's long term care system based on the findings from the CLTC project.

PLANNING FOR INCREASED NUMBERS

I soon learned that South Carolina was in the forefront among states in planning for the long term care service needs of its growing elderly population. What made this effort most impressive was the level of interest and commitment by the legislative and executive branches of government in allowing the state to study this complex issue thoroughly and to use the CLTC project findings to guide the development of State policy.

The Council, whose members included a representative of the Governor, and the Commissioners from the Department of Social Services, the Department of Mental Health, the Department of Health and Environmental Control, the Commission on Aging and the Department of Mental Retardation, was also fully committed to defining the long term care service needs of the elderly population, to developing appropriate service responses to meet these needs and to conducting a rigorous evaluation of the project.

The Council was acutely aware of the rapidly increasing elderly population and the concomitant increase in the demand for long term care services. Between 1970 and 1980, the number of South Carolinians over 65 had grown by 51 percent; further growth between 1980 and 1990 is expected to reach the 45 percent level. Fortunately, most of the elderly will not need institutional long term care services during their lifetime. However, as the number of elderly increases, we know that more and more individuals will need formal services from the health care system. This increase in the need for services will be particularly evident among the age 85+ segment of our population. This group which will increase by 55 percent between 1980 and 1990 is ten times more likely to need long term care assistance than those elderly in the 65 to 75 age group.

The Council also realized that State fiscal resources would be limited and that the long term care system tested in the CLTC project should be the most efficient in terms of client outcomes and cost. In order to have an opportunity to address these outcome issues, the Council agreed to incorporate a rigorous research and evaluation design as part of the Project. This design required that some potential project participants be assigned to the control group which would not have access to the new program of services and which would serve as a comparsion group to determine the impact of the project. Utilization of this approach was a very difficult decision for the Council; however, in retrospect we have, on numerous occasions, been thankful that this more scientific evaluation design was undertaken. This approach has allowed the State to make more definitive statements regarding the needs of the long term care population and the effectiveness of various system responses in meeting these needs.

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EVALUATING THE PROJECT

The evaluation of the CLTC project was based on 10 research hypotheses which predicted that experimental patients (N=953), compared with control patients (N=914), would have favorable outcomes on measures of functional health, use of health care facilities and the costs of health care services. Although all participants were in need of skilled or intermediate levels of care services upon project entry, it was specifically predicted that experimental patients would use nursing homes less than control patients.

The major findings from the project, which was conducted from July 1980 to June 1984, were:

- — Mortality rates between groups were almost identical. By the end of the project, 40 percent of participants had died.
- — Disability levels, as measured by activities of daily living and mobility scales, remained very stable for both groups over time. Neither group experienced great improvement or decline or any measure of functional health.
- — The experimental program had no impact on the use of inpatient hospital services.
- — Experimental patients had significantly fewer nursing home admissions ($p < .05$) and significantly fewer nursing home days ($p. < .01$) than controls. After three years, 48 percent of the experimental group and 60 percent had entered nursing homes.
- — Total Medicaid costs per patient per day of project participation did not differ significantly. The experimental group averaged $13.48 per day and the control group averaged $14.69 after three years' participation in the project.

The new statewide CLTC program, which is in its formative stages, is the result of this planning and research effort. The program offers to Medicaid eligible, long term care patients a choice of the locations in which their care will be delivered, without having adverse impacts on either patient outcomes or public health care costs. This new initiative was made possible through the combined efforts of many individuals in the state, and is an excellent example of informed government policy development.

FUTURE LONG TERM CARE ISSUES

The Community Long Term Care Program should be viewed only as an initial step towards meeting the health and long term care service needs of our elderly citizens. Future policy concerns should be focused on the issue of developing methods for insuring and/or accumulating savings to meet an elderly individual's potential need for long term care services. Such care can be very expensive; many elderly citizens exhaust their entire life savings in meeting the costs of their own care or the cost of care of a spouse. Through the Medicaid program, government is practically the only insurer currently providing long term coverage. This coverage is available only to the impoverished. Government policy must be changed in order to change the public's perception that the government will assume the costs for long term care. Individuals should be encouraged to assume more responsibility for their own potential risks of needing long term care services. Many methods are being considered to achieve this goal. The two most promising proposals are the development of long term care insurance and IRA (Individual Retirement Account) types of savings programs established solely for long term care.

The Long Term Care Council and others will be investigating many of these options in the future. Joint effort and commitment like the initial effort exhibited in the CLTC project will be needed to guide the development of State policy to address these issues. With Government, the private sector and the State's elderly citizens working together, I am certain that these goals can be attained. □

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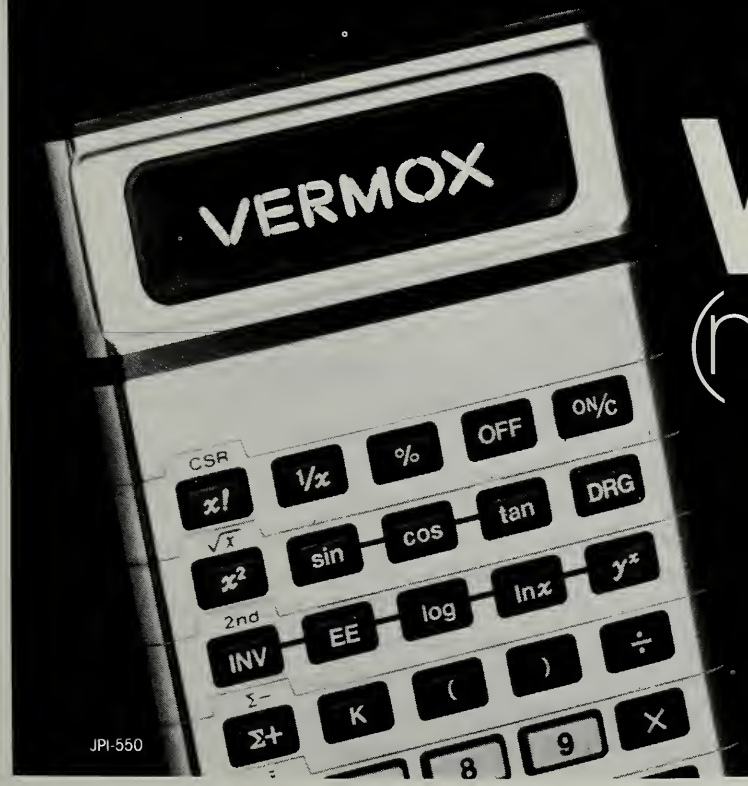
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SOUTH CAROLINA COMMUNITY LONG TERM CARE: COORDINATING RESEARCH AND SERVICE*

THOMAS E. BROWN, JR.
DONALD K. BLACKMAN

THE COMMUNITY LONG TERM CARE PROGRAM

Providing long term care services for the aging and disabled has emerged as a major responsibility for state and federal governments. A complex system of publicly-funded health and social services has evolved over the past three decades; nevertheless, serious problems remain with regard to availability, access, appropriateness and financing of these services. In response to the problems of rising demand and few resources for long term care, the South Carolina General Assembly authorized the Community Long Term Care project in 1978. Community Long Term Care was designed as a research and demonstration program which would develop a model community-based long term care system for the State. Funding for the project was obtained from the state and federal governments through Medicaid 1115 and Medicare 222 research and demonstration waivers. The project was conducted in Spartanburg, Cherokee, and Union counties from July, 1980 through through June, 1984.

The findings from the CLTC project have been utilized to modify the State's Medicaid long term care program. Community Long Term Care has been implemented statewide and includes the key elements which were tested in the research and demonstration project. Specifically, a mandatory pre-admission screening program for nursing home care has been coupled with expanded eligibility for home-based care and expanded home and community-based services. These changes provide a new system of care which, when coupled with traditional hospital care and nursing home services, provides a more comprehensive approach to meeting the needs of South Carolina's aged and disabled citizens through Medicaid-reimbursed long term care services. The purpose of this paper is to summarize the principal components and some key findings from the Community Long Term Care project; and to discuss some of the issues which were addressed in designing the evaluation of the project's effectiveness.

THREE POLICY INITIATIVES

The key elements of the CLTC program were three policy initiatives: mandatory pre-admission screening for Medicaid-reimbursed nursing home care; integration of services and continuity of care through service management; and expanded availability of community-based long term care services.

Mandatory pre-admission screening required that applicants for Medicaid nursing home benefits in the project area be assessed and certified for nursing home care before Medicaid nursing home payments were authorized. CLTC became the single point of entry to Medicaid long term care services, which insured that all people who were at high risk of institutionalization had access to the CLTC program. Service management had the dual functions of (1) helping clients make full and appropriate use of all services available to them while (2) providing control and monitoring of the use of experimental services. Service management was the only service that experimental clients were required to use.

The availability of community services was expanded through two additional program benefits. Expanded eligibility for regular Medicaid benefits allowed individuals whose incomes were between 100 and 300 percent of the Supplemental Security Income maximum monthly income to receive the full range of Medicaid services in the community in return for a limited monthly copayment. Prior to the project, these clients would have been otherwise eligible for Medicaid benefits only after they entered a nursing home. The second program benefit was expanded community services which were designed to supplement

* From the South Carolina Department of Health and Environmental Control, Columbia, S. C. 29202.

existing community-based services. These services included personal care, medical day care, respite care, regular and therapeutic home delivered meals, medical and social services, physical therapy, occupational therapy, and speech therapy.

Project participants were 18 years or older, were residents of one of the project counties, were initially certified for skilled or intermediate nursing home care, and were certified by the county Department of Social Services as being Medicaid eligible. Applicants were randomly assigned to the experimental or control group following level of care certification.

IMPLICATIONS OF RESEARCH FINDINGS FOR SERVICE DELIVERY

The evaluation of the CLTC project was based on ten research hypotheses which predicted favorable outcomes for experimental clients, as compared with control clients, on measures of functional health, use of health care facilities and cost of health care services. Pre-admission screening successfully selected participants who were at substantial risk of instutionalization with high levels of physical impairment. Findings indicated that the CLTC experimental program increased long term care service options and reduced dependency on the use of nursing home care with no observed adverse impact on either client outcomes or public health costs. Medicare and Medicaid costs for the CLTC experimental program were not significantly different from the cost of participation in the regular Medicaid program. Experimental clients used fewer regular Medicaid resources than control participants, mainly due to significant reductions in the use of nursing home care. When expenditures for experimental services were included, the total Medicaid cost for the two groups did not differ significantly. Analysis of quarter-by-quarter expenditures suggested that CLTC spent more for experimental clients during the first six months, with smaller expenditures later on. Based on the three year analysis, average Medicaid daily cost of participation was substantially lower for the experimental clients. Medicare costs were also not significantly different between groups.

An important finding for the development of long term care policy was that the expanded eligibility benefit did not lead to a substantial increase in total cost for regular Medicaid services. Expanded eligibility increased regular Medicaid costs only by seven percent because (1) one-third of the experimental clients were already eligible for regular Medicaid services as S.S.I. recipients, and (2) approximately 80 percent of regular Medicaid costs were for nursing home care.

The experimental program had a neutral impact on the use of inpatient hospital services. Although larger proportions of experimental clients had hospital admissions, they averaged one to two fewer hospital days in each analysis period. The impact on nursing home use was dramatic. Experimental clients had significantly fewer nursing home admissions and significantly fewer nursing home days than controls. After six months, 38 percent of experimental clients and 53 percent of controls had entered nursing homes. After three years, the nursing home admissions had risen to 48 percent for the experimental group and 60 percent for controls.

COMBINING RESEARCH AND SERVICE DELIVERY

The Community Long Term Care project was designed to test the impact of two different systems for providing Medicaid-reimbursed long term care service. The project used a longitudinal experimental design in which project participants were randomly assigned to experimental and control groups. Control group participants received the institutionally-biased long term care program that was in place at the beginning of the project. Experimental clients had access to a more flexible system of service alternatives which included nursing home care but also included much greater availability of community-based services.

The longitudinal nature of the project and the special characteristics of the population under study presented a number of methodological problems that had to be addressed in the research design. Significant among these issues were: (1) protection of clients' rights and welfare; (2) sample loss and the related problem of maintaining comparable comparison groups; and (3) developing a longitudinal research design in a program with open enrollment.

PROTECTION OF CLIENTS' RIGHTS AND WELFARE

Research involving human subjects requires that the study design provide for the maximum protection of the rights and welfare of the clients.

Due to the nature of the experimental design and the need for random assignment to experimental and control groups, the project had to address a number of ethical issues, including the following:

1. control group participants might be denied a beneficial treatment;
2. experimental clients might experience harm from the intervention;
3. enrollment in the demonstration might deprive patients of services to which they were entitled; and
4. confidentiality of patient information might not be maintained.

The CLTC project implemented a number of policies and procedures to minimize the potential for adverse effects of project participation. These included voluntary participation without fear of loss of benefits for refusal to participate, confidentiality of client information, an internal peer review and external utilization and review system to assure that services meet quality standards, and ongoing review of the CLTC project by an external Institutional Review Board which was established to insure that the project developed acceptable procedures for safeguarding the health and well-being of project participants.

SAMPLE LOSS AND THE COMPARABILITY OF CONTRAST GROUPS

In any experimental research design, different treatments are tested with individuals or groups of individuals who are as similar as possible. The Community Long Term Care project was designed to assure to the greatest degree possible that experimental and control groups would be carefully matched. However, the impact of certain program procedures and changes in Medicaid program policies affected the comparability of both groups throughout the project. Attrition occurred in both groups; however, a larger portion of the control group was lost from project participation, 28 percent, compared with 22 percent for experimental clients.

The primary reason for the differences was that 17 percent of the control group either failed to apply for Medicaid or were ruled financially ineligible, compared to 11 percent of experimentals. In the CLTC project, the protocol required group assignments before financial eligibility was determined. It appeared likely that the experimental group had a greater incentive to complete the Medicaid eligibility process than did the control group. Death accounted for an additional seven percent of attrition in each group, and four percent of the control group vs. three percent of the experimental group were lost to the project for other reasons.

Sample loss was not expected to appreciably alter the composition of the groups. It was expected that the same types of people would drop out from the two groups and that the remaining participants in both groups would be similar. Later analysis suggested that the randomization process was successful with respect to most demographic characteristics but that the control participants as a group were more impaired on functional health status measures of mobility, personal activities of daily living and instrumental activities of daily living. While the differences were small, special statistical techniques were required to analyze the project's effectiveness.

Although the differential sample loss presented methodological problems, it did provide evidence of the soundness of the experimental design. There were no differences between groups among people who died nor among people who dropped out after financial eligibility had been determined. If these had been the only sources of sample loss, there would have been virtually no differences between the experimental and control groups. Differences between groups were due almost entirely to the larger number of control participants who chose not to complete the Medicaid eligibility process. It may have been that the benefits offered by the regular Medicaid program were not a sufficient incentive for less impaired control participants to complete the often difficult eligibility process. In contrast, the experimental program provided a number of added incentives for participation. In a sense, the differential drop-out rates were indirect measures of comparative attractiveness of the two systems of care.

DEVELOPING A LONGITUDINAL RESEARCH DESIGN

In many longitudinal experiments, a single group of participants is chosen at the beginning of the study and followed until the study ends. No other participants are added after the study has started, so the study findings are concerned only with the initial group of participants. Obviously, this type of participant selection procedure was neither possible nor desirable in the CLTC project. Admission to the CLTC project was open

continuously through March, 1984. By the end of the project, in June 1984, 1,867 people had participated for widely varying lengths of time. For example, a participant admitted in September of 1980 could have participated for over three years, while a participant admitted in September of 1983 could have participated for less than one year.

In order to study the impact of the project over time, participants were divded in four non-exclusive subgroups according to their dates of entry into the project. Subgroups were developed for six months, one year, two years, and three years of participation. The use of subgroups made it possible to conduct valid longitudinal studies with the largest possible pool of CLTC participants. □

Meeting Announcement

SOUTH CAROLINA CHAPTER AMERICAN ACADEMY OF PEDIATRICS

ANNUAL SCIENTIFIC SESSION
"Cardiology for the Pediatrician"

Faculty: Dan G. McNamara, M.D., Paul R. Lurie, M.D., and Paul C. Gillette, M.D.

Meeting Site: Mariner's Inn, Hilton Head Island, S. C.

Meeting Dates: Thursday, August 7 — Sunday, August 10, 1986

Credit: Six hours of AMA Category I approved by the South Carolina Medical Association's Committee on Continuing Medical Education, and PREP applied for.

For more information contact: Debbie Shealy, (803) 798-6207.

ON THE COVER

A joint legislative committee was created in 1959 to study the problems and needs of older South Carolinians. The committee was inactive from 1963-1968; a new joint committee to study problems of aging was created by concurrent resolution in 1969. The study committee was continued by resolution until 1978 when it became a permanent committee authorized by statute.

The cover photographs show legislators who have chaired the joint study committee on aging. Reading clockwise, Representative Martha Thomas Fitzgerald (Richland County) was the first chair, 1959-1961. She was also the first female representative to chair a legislative study committee.

From 1969-1976, Senator, now Governor Richard Riley directed the committee. In 1971, the South Carolina Commission on Aging was established as a permanent state agency. Senator Hyman Rubin (Richland County) was third in the committee's chair, 1976-1984. Under these two leaders, the committee was active in recommending legislation of interest to the elderly in such diverse topics as consumer representation, health, housing, tax policy, insurance, recreation and retirement.

Since 1984, the fourth chair has been Representative Pat Harris, Anderson. Representative Harris chairs a committee of nine members; three Senators, three House members and three Gubernatorial Appointees. The legislature has provided staff assistance for them. Today, as before, the Committee on Aging continuously studies the services and facilities for South Carolina's aging, and reports its findings and recommendations to the General Assembly. The recent agenda of policy issues includes community services, death with dignity, the probate code and medical indigency.

— Blease Graham, Ph.D.
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THE HEALTH IMPAIRED ELDERLY PROJECT

LYNN FREDERICK, M.S.W., A.C.S.W.*

INTRODUCTION

Since February, 1980, the Health Impaired Elderly Project has been working toward the primary objective of developing a coordinated system to maximize service delivery to the health impaired elderly in Richland and Lexington counties of South Carolina. The project emphasizes that local agencies which serve the elderly can voluntarily work together to plan and to implement a coordinated system.

There have been three basis functions of the project, a comprehensive uniform assessment process among agencies; a central client data system for sharing individual and aggregate client data among agencies; and the natural support system for the health impaired elderly.

UNIFORM/COMPREHENSIVE ASSESSMENT OF CLIENT NEEDS

At the heart of the system is a standardized process for comprehensive assessment of client needs. The assessment process includes an evaluation of the client's socio-demographic status, informal support systems, and individual functional and health status. Before the Health Impaired Elderly Project developed, each agency used a different assessment process. Most social service agencies did not assess client's functioning status in the area of activities of daily living; for example, bathing, dressing, toileting, transferring, eating/feeding, bowel and bladder functioning were not consistently evaluated. Moreover, few agencies collected information regarding the client's ability to perform in cooking, in cleaning and in getting around. Ironically, these are the very areas in which many agencies provide direct services, including homemaker services, home delivered meals and transportation.

Toward the end of the first year of cooperative work, the agencies participating in the Health Impaired Elderly Project agreed upon a comprehensive client assessment form. This agreement was the culmination of a series of monthly meetings, involving two groups: (1) an executive group representing the participating agencies, and (2) a service provider group, mostly social workers and nurses from these agencies. The service provider group designed the assessment form, based on the PACE form developed by Ellen Jones at the Center for Health and Medical Care at Harvard University. The executive group reviewed the form and formulated a plan for its interagency use. Agencies which could not adopt the form agreed to complete a comprehensive assessment of clients using a uniform data set which included the core items of the standardized assessment form. Some agencies did not adopt the uniform assessment process but agreed to allow workers from their agencies to be trained in the area of comprehensive assessment. During the first year of the project, the staff trained approximately 700 workers from hospitals, social service agencies, home health care agencies and mental health agencies. This effort fostered effective communication among agencies by providing a common language for describing clients.

THE CLIENT INFORMATION SYSTEM

Once the comprehensive client assessment process had been implemented, work was started on developing a system for sharing information on an interagency basis. While it is common for agencies to share information about clients, there are few client information sharing systems. In the second year of the project, a client information sharing system manual was developed by using the telephone, mail and client files. Workers trained in comprehensive assessment by the participating agencies were issued a secret code which enabled them to call the Client Information System (CIS) by phone to inquire whether a client was on file. If so, the worker could request a copy of the client assessment, not only enabling the worker to obtain valuable information regarding the client but also preventing unnecessary duplication of the assessment process. For example, if a home health nurse completed an assessment and submitted it to the central file on Monday, a social worker from the Council on Aging could

* Central Midlands Regional Planning Council, Columbia, South Carolina.

call on Wednesday, receive the assessment and use it to determine if the client was eligible for home-delivered meals.

In 1980, the number of health impaired elderly in Richland and Lexington counties was estimated to be 4,500. This represents 15 percent of the elderly population of the two counties. National studies have indicated that approximately 15 percent of the elderly are chronically health impaired. In February 1982, there were 700 assessments on file; October 1983 there were 1,553; currently there are more than 4,500 assessments on file. In 1983 assessments were sent to CIS at the rate of 100 per month, increasing to the current rate of 270 per month. Since many people do not seek help from the formal service system, the total target population is not reached by the system. Only persons seen by the formal service system are on file; not all persons on file are severely impaired. However, 75 percent of the clients on file have some impairment in functioning, and 85 percent have at least one diagnosed health problem.

Maintaining client confidentiality has been critically important to the success of the client information system. Not only did the rights of clients have to be protected, but workers and agencies also had to be assured that information which they submitted to the system was treated with proper safeguards. The following measures were taken regarding client confidentiality:

(1) Only clients who signed a consent form were submitted to the central file.
(2) The client consent form allowed the clients to exclude certain information from being entered into the system and to exclude certain agencies from access to their assessment. While this option was rarely used by clients, it made clients and workers more comfortable about the process.
(3) Only workers who had been issued a secret code had access to the system.
(4) The data on file were primarily objective data in a checklist format. In training sessions, workers were cautioned to be as objective as possible when completing assessments.

In April 1983, the project purchased a PRIME computer. Client data have since been entered into the computer to facilitate the preparation of aggregated client data. These data will be used for management and planning purposes by executives of the agencies involved in the project. The need for certain services will be documented through this computerized system.

CASE COORDINATION/CASE MANAGEMENT

In April, 1982, two interagency case coordination teams were started, one for Richland County and one for Lexington County. It was decided that the teams would meet monthly and would include representatives from health, mental health and social service agencies which had agreed to participate in the Health Impaired Elderly Project. A social services representative chairs the Richland County team and an aging program director chairs the Lexington County team. The teams presented client cases, usually health impaired elderly but also chronically impaired younger adults, in which there were complex needs or multi-agency involvement. Each client to be presented was assessed using the comprehensive assessment process designed by the project, and the assessment form was sent to the CIS. The team then prepared an interagency case plan for each client presented.

After a year of operation, team members were asked to evaluate the usefulness of the team in terms of communications among members, benefits to participants, help in managing a case, reduction of time involved in a case, impact or benefit to clients, and the decision making process. While the workers did not believe that the teams reduced work time, they saw definite benefits for their clients and for themselves by using the teams approach.

One contracting agency began a model case management system in late 1982. Further refinements were made early during 1983. Case Management standards, policies and forms were then developed and compiled in "Case Management for the Elderly: A Manual of Procedures." By July 1, 1983, case management was fully in place in all contracting agencies. This system now ensures timely client reassessments, which in turn ensures changing service plans and service delivery to meet changing client needs.

The addition of a referral page and change in the name of the Client Assessment Form to the Application for Services Form facilitated the tie-in of Agencies other than contracting agencies. While the system has the strong focal point of the Aging Network agencies, broad based involve-

ment of other agencies remains essential to the system. This system will insure that clients who have complex needs will be followed most closely, while those with less complex situations will be reviewed at least yearly.

The review of computer printouts of client information by case coordination teams from HIEP agencies plus private sector agencies, further ensures that vulnerable clients who need and use service resources of various agencies will not "fall through the cracks" as their needs change.

INFORMAL SUPPORTS

Most of the care needed by the elderly is provided by the informal sources of family, friends and neighbors. Since this source of care is so significant, the project worked toward maximizing this informal system, with the following assumptions:

1) That current voluntary care providers want and could benefit from education and training; and there is a set of knowledge which could be helpful to voluntary care providers.
2) That public awareness of the need for voluntary care could be increased and would lead to more persons engaging in voluntary care for the elderly.
3) That by bringing potential volunteers and volunteer coordinators together — new voluntary care providers could be recruited.
4) That persons involved in intensive care provision need support and relief.
5) That churches and agencies can work in coalition to maximize voluntary care.

With these assumptions in mind the project staff took several additional steps. First, The Task Force on Voluntary Services to the Elderly (TFVSE) was organized, composed of volunteer coordinators from agencies which serve the elderly. Second, the TFVSE was encouraged to sponsor training sessions for persons engaging in or interested in providing voluntary care for the elderly. Third, project staff encouraged the development of caregiver support groups.

CONCLUSION

During the past five years the Health Impaired Elderly Project staff has found the development of a coordinated system of care for the elderly to be a difficult and highly complex task. The myriad of agencies which come into contact with the elderly are diverse in the disciplines they represent and in the services they offer. The arenas of health, mental health and social services each have their own terminology and standards. The development of a standard comprehensive assessment process, a central client file, interagency case coordination teams, and mechanisms for encouraging informal supports have all done a great deal toward unifying the service system for the elderly in Richland and Lexington counties. While the staff and agencies involved in the project have not designed and implemented a *perfect* system, they have indentified certain elements which *promote* a coordinated system. Many communities are now contacting the project out of interest in replicating some of the elements of the project. It seems that as long as services for the elderly remain fragmented in their auspices and funding, communities will grapple with the problem of coordination of care for their health impaired elderly population. The Health Impaired Elderly Project offers opportunities for learning and guidelines for the difficult task of service coordination for this client group. □

THE EXTRAORDINARY LIFE HISTORY EXPERIENCE

HILDA K. ROSS, PH.D*

Life History, Oral History, and Reminiscing are terms used interchangeably. Collectively, they refer to the recounting of an individual's past, either in a one-to-one setting or in a group. However, not until the past few decades has this method been identified as a therapeutic tool with special clinical value for older individuals. With clinical resources reporting the extraordinary therapeutic value in verbally retelling one's life's events and reflections, the paucity of literature describing its use is surprising. The reasons could be that it appears mundane, or that it is so accepted as to be overlooked, or that it may be viewed in derogatory terms as in the 1960's and 1970's when older people who did reminisce were described as old fogeys, crotches, senile or always living in the past. For some of these people, the past was clearly more pleasant than the reality of their present circumstances, so that escaping back in time was a useful coping strategy which observers may not have considered.

This year, a Life History course (the other terms could be used as well) was offered as a South Carolina Department of Mental Health inservice geriatric clinical training program for staff.** The students' final assignments were to identify an older person unknown to them, to invite the person's participation, and to complete a Life History. They learned that with sensitive guidance most of the older people were able to consolidate periods of their lives, to review whole periods with clear vision, and to complete certain unfinished business. "I never told my brother how his action towards me ruined my outlook on life when we were small," said one older person, and in front of the student, telephoned his brother.

Final evaluations of the course revealed that the Life History experience benefitted the students as much as the older participants. The students no longer maintained a static, cross-sectional view of a person caught at his particular age. As they moved through the sequential process of the life story, the students unveiled persons who grew into adulthood and maturity. Personalities were flowered with aspirations, hopes, disappointments and resolutions. Some students indicated that this revelation altered forever how they viewed an older person.

As for the older participants, some were able to overlook the harsh realities of their environment. Some students observed tranquility and improved acceptance of other people after the older person appreciated his past and that he had done the best according to his ability. The urge to plan ahead for the remaining years was viewed with serenity. Others became better able to be who they are, with comfort, and even with light-heartedness in some cases.

Globally, whether the purpose of the Life History procedure is clinical or merely to have a bound book of one's life story, similar expressions of regrets, of guilt, of mistakes, and of poor or good choices are voiced by the individuals.

All older people carry past conflicts requiring resolution, or recognition of accomplishments may need to be reviewed and reintegrated. Most older people accomplish this by their maturity, popularly called wisdom. They can place previous events into a perspective that once and for all resolves issues which had lingered unhappily for years. However, the Life History makes such perspectives much easier to achieve.

The process allows a person to work through past disturbing events by resolving and integrating them into the life cycle, in his maturity to allow unfortunate happenings to rest; and then to move on with positive and happier thoughts.

The ability of the elderly persons to transcend personal difficulties was both awesome and inspiring to the students who said that in their circumstances, they would never exhibit similar courage. What is the basis for this courage? Robert Lifton[1] asked, is it by seeing themselves as living through their children (biosocial transcendence)? Is it by seeing and believing themselves a part of all life and continuing to exist as a part of the universe (natural transcendence)? Or is it a belief

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** Lecturer: Barbara Haight, R.N., M.N., Ph.D., Faculty MUSC, College of Nursing.

that life on earth is preparation for eternal life with God (religious transcendence)? The students, not yet challenged by their own mortality, could not fully know the inner search older people had developed in order to sustain their courage. Recording the answers to life's challenges should encourage older individuals to enter the extraordinary experience of going through their own story and having it permanently book bound. This serves two purposes; not only for the valuable personal satisfaction, but also for its intrinsic value for younger family members who can learn about aging. Most of us do not know what our parents were thinking as they moved into their late years, nor the strategies they developed to sustain their integrity as older people.

Is there a difference in a Life History between non-clinical settings and clinical settings? Actually, it is more a consideration of degree, primary focus and setting rather than substance. Key differences involve the following factors:

Clinical	*Non-Clinical*
Emotional levels can be raised by painful recollections as well as by very happy times	Same
One-to-one or in a group	One-to-one
Professional guidance by a trained and experienced clinician	Same
Person is asking for help or is referred for help	Person is not asking for help
Not useful for regressed patients in the group	Not useful for the regressed person
Statements or issues may be probed for hidden meanings	Questions are asked for the purpose of attaining a logical sequence, filled with warmth, introspection, and humor
Individuals are screened for admission into a reminiscing group therapy session	Individuals are not screened
Focus is on abating unresolved events	Focus is on processing the Life History, may incidentally abate unresolved events
Clinician responds to behavior; begins wherever client begins; moves in from there	They start with earliest childhood. Both individuals initiate the process by outlining broad categories to be covered in a series of hourly sessions
Information may be recorded as clinic notes, or taped	Information is formally prepared and book bound. (Author's preference.) Other professionals may leave the information on tape
Occurs in Institution or clinic or therapist's office	Can be in clinic setting but usually informal in home or in an office

CONDUCTING THE LIFE HISTORY

In my work with an individual in the non-clinical setting, the person decides what he wants to talk about and to what depth he cares to explore. He does not raise issues which he does not want to share. He may choose to talk with me "off the record," and I encourage it. I may advise the person to exclude a particular statement because printed material is permanent, clearly stated and deliberate. Unless there is an explanation accompanying a derogatory word or feeling, I advise against its inclusion. I am asked, "What questions do you ask?" The questions vary with the individual. They are predetermined before the next taping session so that the individual has a week to reflect on the answers and perhaps to telephone relatives for accuracy. The person is guided from his early childhood to the present. We agree on an outline to be followed at each session for the taping and the individual can choose to make each

session as detailed as he wishes. Generally, I have found that people in their 60's are best able to be introspective, becoming less so in their later 70's and 80's. Nonetheless, there are individuals from their 50's to their 90's who perform well with this technique.

Lewis and Butler[2] in reporting on their work, encourage pilgrimages to places of birth to talk over old times with remaining family, or reunions because they provide "a measure of where a person stands in the course of the life cycle."

I am suggesting that the Life History is just as valuable outside the clinical setting as in it. Indeed, many persons have made good attempts by writing spontaneously about specific events in their past. Some even achieve notable autobiographies. Diaries are kept. Havighurst and Glasser[3] found that from 10 years onward, people reminisce, increasingly so after that age. Bits and pieces of one's life story can be compiled without professional guidance. In fact, one does not require a clinician to achieve therapeutic results. It occurs in the informal setting by writing, or in the telling. Reminiscing alone and in silence is also valuable. It may not develop in a permanently bound form, but the extraordinary value to the individual in either setting is undeniable. □

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PROUD PAST
20th
DYNAMIC FUTURE
South Carolina
Commission on Aging

SENIOR AFFAIRS LEARNING AND TRAINING YARD

GEORGE P. FULTON, PH.D.*

This essay explores a potential approach to research and learning alternatives for the elderly. The program for senior citizens could be created as a model to accomplish objectives for a center on aging.

RESEARCH

Participants in Senior Affairs Learning and Training Yard (SALTY) may contribute to research findings about their needs and achievements if they are selected as a statistically significant cross-section of the elderly. The members of the program would then be available for observation, psychological study, nursing care interventions, medical geriatric interventions, sociological studies, recreational interventions, educational research, and various intellectual projects that could advance understanding in the field of gerontology.

LEARNING ALTERNATIVES

As part of a center on aging, SALTY is ideal for a college or university setting. The program would contribute to the well-being of the senior participants who enroll in the program through activities that are unique to the university environment.

Among these activities are various opportunities for participation by the elderly in a college or university experience. *First*, there might be the opportunity to attend classes for specific purposes, or for interest only in consultation with a staff advisor. *Second*, opportunities may be created for SALTY participants to take part in guided field trips to points of historic significance, state parks, museums, sites for nature studies, or to industrial plants. *Third*, participants may serve as volunteer mentors to students from grades K through 12. College level students seeking guidance in the selection and preparation for careers may benefit from counseling with experienced, retired careerists. The Program for Shared Experience could be adapted for this purpose. *Fourth*, there are opportunities for hands-on creative work under supervision in the arts, music, theater, social projects, media, computer applications, library science, health affairs, photography, medical technology, as well as bench work with wood, metal, or plastics at collaborating Technical Colleges.

PROGRAM CONTRIBUTIONS

Program participants have the potential to contribute as volunteers to the advancement of the purposes of the college or university. They may be assigned to regular faculty members as volunteer research assistants, laboratory assistants or readers of student papers. They may also act as guest lecturers, literature searchers, or writers.

Some members of the program may be selected as senior externs. These individuals might be assigned by a center for aging as special extenders to assist with the development and coordination of pre-retirement programs in corporations. They could also participate in a variety of community endeavors relevant to gerontological concepts and purposes, such as lecturing or representation at special events, seminars, or workshops.

PROGRAM BENEFITS

SALTY contributes to the families of the senior citizens when the families need respite time or released time in order to work. This encourages families to have their elderly within the home environment. Some difficult pragmatic obstacles could be overcome, for example, reducing transportation costs, since working couples could drop off and pick up senior participants on a 9 to 5 schedule. It provides an alternative to live-in sitters for the elderly and to premature placement in nursing homes.

The potential benefits allow a basis for reasonable charges for admission to SALTY, perhaps through third party payments. Program gener-

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ated revenue, through charges for services by participants, may also prove feasible. These resources lead to possibilities for financial assistance through scholarships. A type of work-study program might also be devised for some participants through gerontological program assistantships.

Overall, the largest benefits may be to the elderly participants themselves. SALTY is one way to combat the loneliness syndrome. It promotes self-sufficiency and personal satisfactions. It provides opportunities for significant continuing contributions to cultural development and social improvements. Through SALTY, elderly citizens may maintain ties with the mainstream of life.

A key to the program is the maintenance of personal zest and an individual instinct for learning. The elderly need to sustain opportunities to relate to the community at large as well as to continue access to the health and medical-providing components of the community. The incentives and organization of this program offer the potential to promote these goals.

A SPECIAL POSSIBILITY FOR RESEARCH

Elderly citizens have personal repositories of information and needs of special interest to researchers. Such resources are difficult to study through conventional laboratory or experimental models. Interactive learning techniques may be a special possibility for quasi-experimental approaches to gerontological research which would enhance knowledge and understanding of the needs and capabilities of the senior citizen. Interactive learning utilizes computer-assisted videodisc and touch-computer-recall programs.

Directly, creation of a retrievable pool of recorded concepts and information actively provided by elderly scholars is desirable. This pool could either serve as a Delphi Panel on significant public problems or as a retrievable pool for interactive learning with younger scholars. There is potential for academic uses in teaching or research, such as a guest lecture on videotape. The contributors may also generate new information by interacting with researchers on specific problems. For examples, simulations may be designed based on the documented judgments of the participants.

An available pool of information generated by senior citizens is a potential training device with which to enrich the preparation of gerontological psychologists, social gerontologists, geri-aides, and others with professional interests in gerontology. Finally, State agencies, industries, schools and other aging centers nationwide may be able to generate comparative information on gerontological services and generally enhance our scientific understanding of aging. □

AGENCIES FOR THE AGING IN SOUTH CAROLINA

A NETWORK OF AGENCIES

Agencies at the state, substate, and local city-county levels assist in the planning and provision of care for the aging in South Carolina. Collectively, these agencies may be called the *South Carolina Network for the Aging.*

Among the state agencies included are the South Carolina Commission on Aging, Department of Health and Environmental Control, Department of Social Services, and the Department of Mental Health.

The South Carolina Commission on Aging

The linch pin of the network is the South Carolina Commission on Aging (SCCOA) which plans and coordinates programs for the existing and anticipated needs of senior citizens. SCCOA distributes federal and state funds and oversees the state's programs for the elderly. The South Carolina Commission on Aging works with 15 Area Agencies on Aging which coordinate local nutrition and social service provider agencies. The provider agencies in most areas of our state are County Councils on Aging. Area Agencies assist and strengthen services delivered at the local level.

County Councils on Aging (CCA) offer Information and Referral, a service that links older people to services and resources to solve their problems and meet their needs. The CCAs also offer Nutrition, a program that includes congregate meals served at nutrition sites where social services are offered and fellowship encouraged. Home-delivered meals are made available for the frail elderly. Other programs at this level include: (1) Outreach, an effort to locate the elderly who need services, but may be unaware of where or how to obtain them; (2) Case Management, the assessment of each senior citizen's unique needs followed by a plan to meet those needs; (3) Legal Services, the coordination of existing legal aid and the development of additional legal assistance; and (4) Homemaker Services, assistance with personal care and home care for the homebound.

The Department of Health and Environmental Control

The South Carolina Department of Health and Environmental Control (DHEC) provides Home Health Services through County Health Departments. These services include skilled nursing, home health aide, therapy (physical, speech, and occupational), dietary counseling, and medical social services. Health department nurses regularly check patients for high blood pressure and provide education about managing the disease with medication, salt reduction, weight loss, and exercise.

DHEC's nine state-aid cancer clinics provide x-rays, laboratory tests, chemotherapy and radiation treatment for indigents.

Department of Social Services

The South Carolina Department of Social Services (DSS) provides services through county offices. Among these programs are: (1) Medicaid, a medical assistance program for the poor; (2) Adult Protective Services, which protects the senile, disabled, and mentally ill from abuse; (3) Food Stamps; (4) New Eyes for the Needy, which provides eyeglasses for the poor who meet certain visual acuity criteria; (5) Homemaker/Home Health Aides, through which welfare recipients are trained to assist the frail elderly in their homes; (6) Alternate Placement and Management Services, which works with adults unable to live independently and suitably in the community; (7) Companion-Sitters for respite and in-home supervision; (8) Homemakers; and (9) Family Management Counseling, a service for people needing assistance in managing their homes, finances, or family relationships.

Department of Mental Health

The South Carolina Department of Mental Health, through its mental health centers, provides staff trained in geriatrics to work with elderly mentally ill clients. A handbook, *Mental Health Services for the Aging,* is available at each center.

Community Support and Emergency Stabilization, Community Homes, Living Skills, Psychosocial Rehabilitation, and Addictions Aftercare are among the programs conducted at the community level. Services for people who are autistic or have other communication or behavioral problems are also available. The Center for Orientation to Independent Living (COIL) is a statewide

program which helps psychiatric patients gain or regain living skills and employment.

Community Action Agencies

Community Action Agencies provide transportation to and from medical providers to all Medicaid recipients. Where funds are available, they provide financial assistance to eligible low-income families to offset rising energy costs. Through a weatherization program, repairs may be made to heating equipment or portable heaters supplied.

Community Long Term Care

Community Long Term Care, through area offices, provides mandatory pre-admission screening and a service management program for persons applying for nursing home residency and who are eligible for Medicaid. Community services are offered as an alternative to a nursing home and they include personal care aides; home delivered meals; medical social counseling; physical, speech and occupational therapy; medical day care and respite care.

The Directory

The current telephone numbers of each of the agencies described above are presented in Table 1 as a ready reference for physicians.

A Note About the Future of the Network

South Carolina has more residents 65 years and older than any other single age group in the state. The elderly comprise about 10 percent of the state's population. United States Government sources project an increase in the number of elderly residents from about 300,000 in 1985 to almost 500,000 by the year 2000.

In early 1986, an independent Florida-based consultant studied the "aging network." The consultant found that the existing services currently provided by the network meet many of the existing needs. However, the study emphasized the importance of further planning to accommodate the increased needs of the future. Governor Richard Riley has issued a plan to support the network of state agencies as they prepare to address the needs of the elderly population during the next decade. □

TABLE 1

County	County Council on Aging	DHEC County Health Dept.	DSS County Office	SC Community Action Agency	Mental Health Center	Community Long Term Care
Abbeville	459-4511	459-2131	459-5481	223-8434	223-8331	223-8622
Aiken	648-5447	648-1364	649-1111	648-6836	648-0481	536-0122
Allendale	584-4350	584-3818	584-2181	536-1027	524-3378	536-0122
Anderson	225-3370 225-0125	225-3731	845-5459	223-8434	224-3513	242-8525
Bamberg	245-4704	245-5176	245-5587	536-1027	536-1571	536-0122
Barnwell	259-3738	259-3661	259-7161	648-6836	648-0481	536-0122
Beaufort	524-1787 524-8079	525-7216	525-7367	524-4245	524-3378	577-0666
Berkeley	761-8412	899-2441	761-8044	761-8244	761-8282	577-0666
Calhoun	874-1270	874-3027	874-3384	536-1027	536-1571	536-0122
Charleston	722-4127	724-5800	792-7290	524-4245	792-7547	577-0666
Cherokee	489-3868	489-8126	487-5801	585-8183	585-0366	582-6044
Chester	377-4822	385-6152	377-8131	327-6151	327-2012	283-8422
Chesterfield	623-2280	623-2117	623-6451	537-5256	479-9091 479-7381	479-9075
Clarendon	435-2883	435-8168	435-8922	775-4354	775-9364	778-5413
Colleton	549-7642 549-5331	549-1516	549-1012	549-5576	524-3378	577-0666
Darlington	393-8521	393-4511	332-2231	332-1136	662-1401	479-9075
Dillon	774-6681	774-5611	774-2434	662-2579	479-9091 479-7381	479-9075
Dorchester	871-5053	577-2011	563-9349	761-8244	792-7547	577-0666
Edgefield	637-5326	637-3159	637-3125	223-8434	223-8331	223-8622
Fairfield	635-3015	635-6481	635-9810	799-2001	758-3503	758-5439
Florence	669-6761	662-5281	669-3354	662-2579	662-1401	479-9075
Georgetown	546-8539	546-5593	546-5134	248-4208	248-7213	248-7249
Greenville	242-1746	242-6160	235-6963	242-3712	235-0184N 963-3421S	242-8525
Greenwood	223-0164	223-8488	229-6622	223-8434	223-8331	223-8622
Hampton	943-5262	943-3878	943-3641	549-5576	524-3378	577-0666
Horry	248-9818	248-6381	365-5568	248-4208	248-7213	248-7249
Jasper	784-2838	726-8121	726-3959	524-4245	524-3378	577-0666
Kershaw	432-8173	432-1426	432-7676	775-4354	775-9364	778-5413
Lancaster	285-6956	283-9948	285-6914	327-6151	327-2012	283-8422
Laurens	984-4572	984-6587	984-0551	223-8434	223-8331	223-8622
Lee	484-6212	484-6612	484-5376	775-4354	775-9364	778-5413
Lexington	252-7734	791-3580	359-8270	799-2001	791-4464 791-4466	758-5439
McCormick	465-2626	465-2511	465-2125	223-8434	223-8331	223-8622
Marion	423-4391	423-4312	423-6421	662-2579	662-1401	248-7249
Marlboro	479-9951	479-6801	479-7188	537-5256	479-9091 479-7381	479-9075
Newberry	276-8266	276-4155	276-7970	799-2001	223-8331	758-5439
Oconee	225-3370 225-0125	638-3639	638-5882	242-3712	224-3513	242-8525
Orangeburg	531-4663	534-7990	531-3101	536-1027	536-1571	536-0122
Pickens	843-2275	878-7821	878-2451	242-3712	224-3513	242-8525
Richland	252-7734	748-4970	254-4276	799-2001	758-3503	758-5439
Saluda	445-2175	445-2141	445-2139	223-8434	223-8331	223-8622
Spartanburg	596-3910	596-3337	596-3036	585-8183	585-0366	582-6044
Sumter	773-5508 775-9013	773-5511	778-2778	775-4354	775-9364	778-5413
Union	427-3119	427-5604	427-5441	327-6151	585-0366	582-6044
Williamsburg	354-7834	354-9927	354-5411	248-4208	248-7213	248-7249
York	327-6694	324-7521	684-2315	327-6151	327-2012	283-8422

Editorial

MEDICAL POLITICIANS

The following editorial first appeared in the April, 1986 issue of The Bulletin of the Greenville County Medical Society. *Many readers suggested its publication here, since it illustrates — once again — the need for more physicians to become involved in organized medicine.*

— CSB

Recently, Charlie Duncan announced his candidacy for President-Elect of the South Carolina Medical Association. Those of us who have known Charlie's superb record as Chairman of the Board of Trustees were both gratified and relieved, because we knew that Charlie had made the tough decision to continue. We knew of the demands on his time. We knew that he had served at a considerable financial sacrifice. We knew that his golf handicap had soared from 3 to 23+. As one of his less charitable colleagues put it, "that Charlie Duncan is a real medical politician. Is he crazy or something?"

This isn't the first time I have heard a highly regarded and competent physician called a "medical politician," who, by reason of his or her elected position as a leader in a medical society, found himself in the middle of many questions and problems that were not strictly scientific. The critic is usually an ivory tower "purist" who takes great pride in being a physician and scientist totally removed from all other aspects of medicine. He makes the flimsy and incorrect assumption that the responsibility of direction and leadership in a professional body, because it is not completely scientific, requires less talent and effort. Therefore, the academy president, the medical society leader, the cancer fund chairman, the chairman of various civic projects and organizations, and the rare physician who holds political office is labeled a "medical politician." Many years ago, Reverend Price Hughes said, "You cannot help being a politician. You cannot live for an hour without being a politician. What a man generally means when he says he is not a politician is this — that all his life he has been enjoying his political privileges and grossly neglecting his political duties; and in that sense the observation is scarcely to his credit. As a matter of fact, politics, properly understood, is simply the Science of Life — the doctrine of the way in which I am to do my duty to my neighbor."

Our medical ancestors were not inhibited by such delicate feelings. We can all take pride that of the 56 signers of the Declaration of Independence, six (over 10%) were doctors. Three of these eventually went on to become governors of their states, one became a congressman, one became the Treasurer of the U. S. Mint, and one became the Chief Justice of the New Hampshire Supreme Court. Even in the 20th century Dr. Leonard Wood became Surgeon General of the Army and then Commander-in-Chief of the U. S. Army. He served as Governor of Cuba and the Philippines, and among his many awards was the Congressional Medal of Honor. In 1920 he missed the Republican nomination for President by three votes. The only thing that slowed Dr. Leonard Wood even temporarily was having a meningioma removed on three occasions over a 22-year span by Harvey Cushing.

Some people will say, "I don't have time for all that, what can I do?" There are a number of questions that every physician should ask herself or himself.

(1) Do you know the names of your representatives and senators both on the national and state level? Do you know the names of your representatives on the City Council, County Council, and school board?
(2) Do you know or have on file their addresses and telephone numbers?
(3) Do you know them personally?
(4) Do you communicate with them with a reasonable frequency, letting them know your views not only on subjects of medical interest but of interest to every good citizen?
(5) Do you thank them when they have helped

you out? Do you compliment them when they have accomplished something worthwhile? Most legislators and people in political office I know tell me that praise is one of the rarest commodities a public servant ever receives.

(6) In primaries and elections, do you back the candidate of your choice with time, money, and effort? Political campaigns have become more strenuous, sophisticated, and expensive each year.

The amount of influence you have on any legislator depends in direct proportion to the times you can answer "yes" to the above questions. Legislators are like everyone else. They tend to listen to and respect the opinions of people they know and trust. The fact that you are a doctor will probably command a little more respectful attention than that of somebody else, but not necessarily so. It is always easier to get an attentive and fruitful hearing from a legislator whom you know personally, whom you write or talk to frequently, and whose campaign you support. I am not implying that you should bribe legislators. Almost all of them are conscientious hardworking people whom you can't bribe. You don't really want the kind that you can bribe anyhow. Because whatever you can pay, someone else can always pay more.

There are still a few people who say, "I am above politics. I spend all my time trying to get people well. Don't bother me with politics." All right, doctor, I won't bother you with politics; but you can bet there are plenty of people who will. There are national and state health programs constantly before our legislators; and you better believe that these programs will bother you. The professional liability problem will probably bother every physician directly or indirectly before he or she retires. All these programs will bother you. They will take your time and plenty of it. They will also take your money by forcing you to hire more help to fill out insurance forms and cope with the newest regulations. They will increase your malpractice insurance rates, increase your business tax, employer's tax, etc. None of this improves your patient care — in fact it will destroy it, unless you do something about it.

I believe that it is time that we recognize the importance of those in medicine who take valuable time out of an active professional life to "involve" themselves. Not for reasons of self glorification, personal egotism, or selfish gain, but in the spirit of *noblesse oblige*. A medical politician owes no apologies to the "medical purist." It is possible to be a medical politician without professional deterioration, reduction in standards, sacrifice of principles, or diminished interest in service to patients. The next time you criticize a person for being a medical politician, think about this for just a little while. He or she is doing a job that you can't or won't do yourself. In the first years of his Presidency, Theodore Roosevelt received a letter from a friend criticizing an appointee of Roosevelt who was trying to do a good job under difficult circumstances. The critic previously had been offered a chance at the same job himself by Roosevelt and had turned down the position. Roosevelt pointed this out to him in very forceful words: "It is not the critic who counts, not the man who points out how the strong man stumbled or where the doer of deeds could have done them better. The credit belongs to a man who is actually in the arena, whose face is marred by dust and sweat and blood; who strives valiantly; who errs, and comes short again and again because there is no effort without error and shortcoming; but who does actually strive to do the deed; who knows the great enthusiasms, the great devotions, who spends himself in a worthy cause; who at the best knows in the end the triumph of high achievement; and who at the worst, if he fails, at least fails while daring greatly, so that his place shall never be with those cold and timid souls who know neither victory nor defeat."

Good luck, Charlie! Our best wishes and support go with you.

Donald G. Kilgore, Jr., M.D.
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FINANCIAL CHECKUP

MARTIN LEFKOWITZ
Certified Financial Planner
Tax Shelter Co-Ordinator: E.F. Hutton

Vol. 6, Issue No. 7 July 1986

TAX REFORM. WE ARE GETTING THERE!

I have copied on the next page, a comparison of tax reform proposals that are currently under debate in Washington. This comparison is reprinted from E.F. Hutton's "Investment Quarterly," summer, 1986..... This quick study is a good starting point to follow the changes that will almost surely occur prior to passage. I will try to keep everyone updated via the newsletter. In the meantime, if you have any questions, please contact me.

TURN TO NEXT PAGE PLEASE!

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If you would like to receive further information on any of the topics covered in this newsletter, please write to Martin Lefkowitz, CFP, E.F. Hutton & Company, Inc. 2700 Middleburg Drive, Suite 200, Columbia, SC 29204; or Call (800) 922-1112.

Comparison of Tax Reform Proposals

	Current Law	President's Proposal	House Bill	Senate Finance Committee
Individual Tax Rates (taxable income)	11-50% (14 brackets)	15, 25 and 35%	15, 25, 35 and 38%	15 and 27%
Personal Exemptions	$1,080 (1986—indexed)	$2,000 (indexed)	$2,000 indexed; $1,500 for itemizers	$1,900 in 1987; $2,000 in 1988; phased out for high income taxpayers (indexed after 1988)
Corporate Tax Rates	15-40% on first $100,000; 46% over $100,000	33% with lower rates below $75,000	15-25% up to $75,000 and 36% over $75,000	15-25% up to $75,000; 33% over $75,000
Nonbusiness Interest Investments	Deductions for home mortgage and investment interest, limited in general to net investment income plus $10,000	Unlimited deduction for principal residence plus $5,000, plus net investment income	Unlimited deduction for mortgages on first and second residences; additional deduction of $10,000 ($20,000 joint) plus the amount of the taxpayer's investment income. Phase in of disallowance over 10 years, regardless of when incurred	Interest on principal and second residences remains fully deductible. No deduction for interest on loan to fund IRA. No deduction for consumer interest (e.g., interest on car loan or credit cards or for investment expense exceeding investment income). Phase in of above (other than IRA) 35% in 1987, 60% in 1988, 80% in 1989 and 90% in 1990, regardless of when debt incurred
Health Benefits	Employer-paid health premiums not taxed; medical expenses deductible if more than 5% of adjusted gross income	First $10 a month in employer-paid premiums for individual ($25 for families) taxed as income; retain existing medical deductions	Retain existing law on taxation of health benefits and medical deductions	Same as House
Charitable Contributions	Deductible	Full deduction for itemizers, none for non-itemizers	No change for itemizers, non-itemizers could deduct amount above $100	Full deduction for itemizers, non-itemizers no deduction
State and Local Taxes	Deductible	Deduction eliminated	No change from existing law	Deduction for state and local sales taxes would be repealed; deductions for income, real estate and personal property taxes retained
Depreciation	Recovery periods of 3-19 years with accelerated write-off	More generous write-off over 4-28 years; value indexed for inflation	Recovery periods of 3-30 years; partially adjusted for inflation	Similar to present law; more generous for equipment but less generous for real estate; 27½ or 31½ years
Capital Gains	60% exclusion; effective rate of 20%	Top effective rate 17.5% with curtailment of certain assets that would be eligible	42% exclusion; top effective rate 22%	Corporate capital gains at 28%; individual rates 27%; no capital loss unless offset by gains plus $3,000
Investment Tax Credit	6-10%	Repealed	Repealed	Repealed
Oil and Gas	Allow percentage depletion and expensing of intangible drilling costs	Repeal oil depreciation allowance for all but small wells; keep "intangible" drilling breaks but subject to minimum tax	Repeal percentage depletion allowance for all but small wells; allow expensing of intangible drilling for non-producing wells; 26 month write-off for producing wells	Little change from existing law
Business Expenses	Deduction	Deduction for entertainment repealed; limit on meals	Deduction of 80% of business meals and 80% of entertainment costs	Same as House Bill and unreimbursed employee business expenses limited to itemizers and subject to a floor of 1% of annual gross income

Sources: Joint Committee on Taxation



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SOUTH CAROLINA MEDICAL ASSOCIATION

AUXILIARY

SCHOLARSHIP AWARDS

The following eight medical students have been selected as recipients of $800.00 scholarships sponsored by the South Carolina Medical Association Auxiliary and the South Carolina Institute for Medical Education and Research.

JOHN P. DAVIS, JR.

NO PHOTO AVAILABLE

John P. Davis, Jr. is the son of John P. and Joyce A. Davis, Sr. of Cheraw, S. C., formerly of Newberry. John is a 1984 graduate of the College of Charleston where he was on the Dean's List and the recipient of the Exchange Club of Charleston Scholarship from 1981 to 1984. In addition, he served as Night Manager of the Student Union. John is currently a second year medical student at the Medical University of South Carolina where his academic achievements are outstanding. GPR 3.33.



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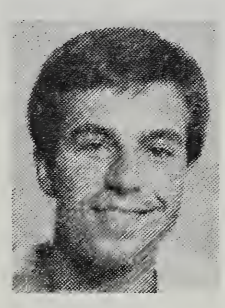


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RUDOLPH MITCHELL NEWMAN



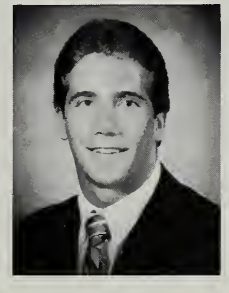
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President's Page



THE PRO CONTRACT: GOOD NEWS AND BAD NEWS

The decision of the Health Care Financing Administration (HCFA) to award the peer review contract to Metrolina of Charlotte, instead of SCMA, has conjured up the old "good news and bad news" jokes. This time, the joke goes like this: "The bad news is SCMA didn't get the PRO contract; the good news is that SCMA didn't get the PRO contract."

Over the last eight or ten years, peer review of Medicare and Medicaid which has been done in this state by the South Carolina Medical Care Foundation — a subsidiary organization of SCMA — has been, for the most part, a worthwhile endeavor. It has provided good peer review for physicians and hospitals; it has given South Carolina physicians a reasonable review organization to deal with; and it has made money for SCMA. As you know, we haven't had an SCMA due increase in eight years now, surely some sort of record for professional organizations in this time of escalating costs and inflation. In part, PSRO and PRO contracts have been responsible. Why then is there "good news" that we didn't get the new contract?

Well, first of all, HCFA has developed patterns for regulating PRO contracts which are increasingly difficult for rational folks to understand and to live with. Hopefully, with a new HHS head, Dr. Otis Bowen, some of the really abominable demands will modify; but at present, running a PRO can be a frustrating and distasteful task. Those really unreasonable demands and capricious rulings are the reasons SCMA refused to continue the previous PRO contract. Our decision to abandon the previous contract — unilaterally — certainly flew in the face of some HCFA officials and is, indeed, perhaps the reason we were not awarded the new contract — one which will allow Metrolina to run our South Carolina PRO.

Second, it seems likely — in this period when all governmental interests in health care seem to be in cost cutting rather than in quality of care — there will be an ever increasing trend toward documentation, surveillance and sanctioning. This would place SCMA in a position not totally to be wished for, having to monitor, criticize and even demand fiscal sanctions of its physician population. It seems the purpose of PRO contracts at this time will be to intimidate physicians and hospitals by insisting on retrospective review and denial, insisting physicians cannot review in their own hospitals, and establishing *quotas* for sanctions of physicians and hospitals. To quote a HCFA official, SCMA's contract offer was "not aggressive enough."

Finally, we will be able to function more clearly as the physician's advocate in dealings with the new "PRO-owners"; clearly we wish for good relationship and dialogue with Metrolina and are satisfied that South Carolina physicians practice careful and cost conscious medicine in the vast majority of cases. When differences do arise, as they surely will, our state organization will be able to take its constituents' part when it is justified and reasonable.

We truly wish Metrolina well in its contract. We will do what we can at SCMA to cooperate. We will, however, be an organization to which our physician population can turn when help is needed.



Walter J. Roberts, Jr., M.D.
President

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THE JOURNAL
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ARTIST TATTOO OR PHYSICIAN MICROPIGMENTATION?

R. PATRICK YEATTS, M.D.*

Once the sole purview of cosmetologists, cosmetic enhancement of the eyelids and brows has extended to the cosmetic surgeon. Angres reported in 1984 a micro surgical procedure in which pigment is implanted into the base of the eyelashes along the lash line in a pattern resembling a dot matrix.[1, 2] For the lack of a better descriptive term, this procedure has been referred to as blepharopigmentation by practitioners of this trade. By others, it is simply known as an eyelid tattoo.

As instrumentation improved, its application expanded to the cosmetic augmentation of the eyebrow.[3] Camouflage of the scalp after hair transplantation, areola pigmentation after breast reconstruction, and lip reconstruction are also reported as potential uses for this technique.

The method for blepharopigmentation or eyelid tattoo is presented and the controversy regarding its use discussed.

METHOD

Preoperative assessment with informed consent regarding the procedure is imperative. Attention is given to vision, allergies, medications (i.e., anticoagulants and Accutane), illness (e.g. recurrent herpes simplex, diabetes, hepatitis), eye disease (blepharitis, previous lid surgery), and scar formation. Discussion of patient expectations, coloration and placement of pigment is reviewed. Photographs are taken. Consultation with a cosmetologist may be elected.

At the time of the procedure, the patient is placed in a supine position. The technique is performed under clean but not necessarily sterile conditions. A local anesthetic is infiltrated subcutaneously into the eyelid with or without oral, intravenous or inhalation sedation. A topical anesthetic is applied to each eye and the lids are prepared in a fashion conforming to the surgeon's specifications (e.g. Betadine). Lid clamps (blepharostats) may or may not be used. A thin film of ointment (antibiotic or antibiotic-steriod combination) is placed on the lids to prevent staining of the superficial keratin layers. The eyelid is now prepared for pigment implantation or tattoo.

Instrumentation for pigment implantation varies according to the manufacturer. Units are comprised of reciprocating needle(s) capable of placing pigment at an appropriate depth within the dermis of the skin. Units vary from one to three needles and by how pigment is delivered to the handpiece. Pigment is delivered to the needle by dipping the needle tip into the pigment or by a delivery reservoir. The handpiece or needles are disposable and recommended for one procedure only. The reciprocating needle is applied within or in juxtaposition to the lash line. Multiple applications are made within the line of lashes. The technique of pigment application (intensity and location) is determined by eye morphology (e.g. close set, deep set, small, prominent eyes, etc.). Excess pigment applied to the skin is cleaned with

* Address correspondence to Dr. Yeatts at 3-D Cleveland Court, Greenville, S. C. 29607.

saline. At the termination of the procedure, an antibiotic steroid ointment is applied and may be prescribed in the immediate postoperative period. The patient is advised as to the limited use of makeup for two weeks following the procedure and to avoid the use of aspirin products and sun exposure.

DISCUSSION

Controversy surrounding blepharopigmentation stems from the sensational promoting of the procedure whose safety has little foundation in medical literature.[4]

To date the medical community's contact with tattooing has been with patients who desire to have tattoos removed for various reasons and patients who presented with its complications. Tattoos have been incriminated in skin cancers (malignant melanoma and basal cell carcinoma).[4, 5] The dermatology literature is replete with reports of tattoo complications including allergy reactions, cutaneous TB, hepatitis, and bacterial infections.[5, 6]

The materials used in blepharopigmentation are reportedly inert and are composed of ferrous oxides and titanium oxides. The percentage of talc may vary according to the manufacturer and has been reported as the cause of granulomas. Manufacturers suggest the absence of complications as the *sine qua non* of safety. Independent laboratory investigations have reportedly been performed, but the results are not available for scrutiny in the medical literature.[7]

The FDA's policy regarding pigments or devices used in micropigmentation is unknown. The FDA has neither approved nor rejected these products. The FDA's longstanding policy regarding tattoos has been to "defer regulatory authority to state and local agencies." Manufacturers suggest that this "cosmetic device" should not be subject to the color additive regulations regarding injectable agents and therefore have gone forth with merchandising their product despite no formal position by the FDA.[4, 7] The failure of the FDA to make known their position has placed increased liability upon the physician. It is generally recommended that these physicians who practice blepharopigmentation notify their insurance companies.

The potential complications of blepharopigmentation are many; the known complications of blepharopigmentation are few. Lash loss, chronic chalazion, and granuloma formation have been noted.[8] Pigment migration, allergy, lid scar, and patient dissatisfaction are also possible.

Since the Angres publication, blepharopigmentation has become one of the most publicized procedures in the lay press, touting the "benefits of permanent eyelash enhancement without the inconvenience of conventional cosmetics." Since the introduction of the technique two years ago, there are no fewer than seven manufacturers of instrumentation, two societies of micropigmentation, and a textbook concerning the technique. Fad or fashion, physician or tattoo artist, the eyelid tattoo is a "sign of the times."[4] □

ADDENDUM

Since this article was submitted for publication, the South Carolina General Assembly passed legislation (H.3717) to provide that it is not unlawful for a licensed physician or surgeon to tattoo parts of a patient's body.

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PENICILLIN-INSENSITIVE PNEUMOCOCCUS: A CASE REPORT FROM SOUTH CAROLINA*

RICHARD R. HOWELL, M.D.
PETER BENDT, M.D.

Until recently, all strains of pneumococcus were believed to be highly sensitive to penicillin. In 1967 a strain of pneumococcus was isolated that was relatively resistant to penicillin.[1] Since then there have been multiple reports of even greater resistance to penicillin as well as other antibiotics.[1-6]

CASE REPORT

The patient is a six-year-old black male who was in good health until January 28, 1986. On that day he developed headache, cough, and pain in the abdomen and shoulder. Over the next eight days he developed anorexia, cough, pain in the left knee and abdomen, chills, and fever up to 104°F. On the eighth day of his illness he was seen in the McLeod Family Practice Center and was admitted to the hospital for evaluation and treatment.

Admission vital signs were temperature 104.4°F, pulse 150/minute, and respiratory rate 34/minute. No focus of infection was obvious from the physical examination. The patient's past medical history was unremarkable for known risk factors associated with penicillin-insensitive pneumococcal disease. These risk factors include prior hospitalization, recent or prophylactic use of antibiotics, and compromised immune status such as sickle cell disease, asplenia, and corticosteroid use.[2, 4, 5] Although there was a family history of sickle cell disease, the patient had never experienced symptoms of sickle cell crisis.

The initial Hgb was 12.2 g/dl, WBC 15,400 with 41 segmented neutrophils and 42 bands, and RBC 4,980,000 with hypochromic, microcytic indices. Chest x-ray revealed consolidation of the right upper lobe. Sickledex was positive and subsequent electrophoresis supported a diagnosis of beta thalassemia plus.

Blood and sputum cultures were done on admission. Sputum gram strain failed to show a predominant organism. Treatment with cefuroxime 100 mg/kg/day was begun. During the first 48 hours of antibiotic treatment the patient's temperature continued between 100.5°-105.4°F. On the third hospital day pneumococcus was identified from a blood culture, and the antibiotic was switched to penicillin G 140,000 units/kg/day. Over the next 36 hours the patient continued to have temperature between 101.2°-103.8°F. On the fifth hospital day an infectious disease consultation was obtained.

Screening sensitivity was performed with a one microgram oxacillin disc. This is an acceptable measure of relative penicillin-insensitivity.[2, 5, 7] The oxacillin zone diameter measured 15-17 mm which is consistent with penicillin-insensitivity. Pneumococcus with zone diameters of greater than 20 mm is generally presumed penicillin sensitive. Pneumococcus with zone diameters less than 20 mm is presumed to be relatively resistant to penicillin.[2, 4] Further sensitivity testing indicated that the organism was sensitive to cephalothin, chloramphenicol, clindamycin, erythromycin, sulfamethoxazole, tetracycline, and vancomycin. Following a switch to chloramphenicol 82.5 mg/kg/day the patient become afebrile. He was subsequently discharged in good condition.

DISCUSSION

Streptococcus pneumoniae is a leading cause of community-acquired pneumonia in children. Historically pneumococcus has been highly sensitive to penicillin. Reports of penicillin-intermediate and penicillin-resistant pneumococci began occuring in 1967 and are now occurring with increasing frequency.[1-3] Estimates of the prevalence of penicillin-intermediate pneumococcus in North America range from two to 15 percent.[2, 5] The prevalence of penicillin-resistant pneumococcus is unknown. It has rarely been reported in the United States. However, in South

* From the McLeod Family Practice Center, 555 East Cheves Street, Florence, S. C. 29501 (address correspondence to Dr. Howell).

Africa the carriage rate is reported to be 0.7 percent.[1] Prevalence rates, however, are difficult to interpret because of variation among different populations and ages. A high rate of carriage and infection is more common among infants and young children. It is not surprising that penicillin-insensitive pneumococcus would appear in this age group and involve the most common serotypes affecting this group. These are serotypes 6, 14, 19, 23.[2, 5, 6]

Screening for sensitivity to penicillin is routinely done with one microgram oxacillin discs. Quantitative susceptibility testing is usually performed on penicillin-insensitive organisms. Minimal inhibitory concentration (MIC) is defined as the least concentration of antibiotic that prevents macroscopic growth. The MIC's of penicillin-intermediate and penicillin-resistant pneumococcus are 0.1-1.0 mg/L and greater than 1.0 mg/L, respectively.[2] Strain serotyping is also performed on penicillin-insensitive pneumococcus. In this case, quantitative sensitivity testing and strain serotyping could not be performed due to the organism's death in transit to the state laboratory.

Pneumococcal infections are a frequent problem. The isolation of a penicillin-insensitive pneumococcus has several important clinical implications. This patient's pneumonia was initially treated with broad spectrum cephalosporin. When pneumococcus was isolated, penicillin G was instituted. The patient's failure to respond to penicillin stimulated reevaluation. The isolation of pneumococcus from a blood culture enabled the correct identification of the organism and its antibiotic sensitivities. With this information the appropriate antibiotic was chosen.

This case illustrates several important factors in the evaluation and treatment of febrile infants and children. These include: (1) routinely culturing the blood of febrile infants and children; (2) routinely testing bacteria for antibiotic sensitivities, especially pneumococcus; (3) reevaluation of infants and children who fail to respond to antibiotic therapy; (4) increased awareness of antibiotic-resistant bacteria, especially pneumococcus; and (5) intelligent use of antibiotics.

SUMMARY

A penicillin-insensitive pneumococcus has been isolated in South Carolina. Physicians treating patients with suspected or proven pneumococcal diseases should be alert to the possibility of penicillin insensitivity. □

ACKNOWLEDGEMENT

The authors express appreciation to the McLeod Family Practice faculty and staff for their assistance in preparing this manuscript.

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RECONSTRUCTION OF CHEST WALL DEFECTS WITH RECTUS ABDOMINIS MUSCULOCUTANEOUS FLAPS

RICHARD C. HAGERTY, M.D.*
JULIAN T. BUXTON, M.D.
ROBERT F. HAGERTY, M.D.

Reconstruction of chest wall defects continues to be challenging. Many techniques have been described, including the use of the latissimus dorsi muscle flap, pectoralis major muscle flap, omentum, and synthetic mesh. The rectus abdominis muscle flaps are an important addition to our armamentarium. Two cases are presented, demonstrating the versatility of these flaps.

CASE ONE

The patient is a 63-year-old white female, who is a chronic smoker with bronchitis and rheumatic heart disease. In 1963 she underwent a left radical mastectomy for breast cancer and was radiated post-operatively. Recently she presented with an ulcer of the left chest wall which extended to the pericardium. An 8 cm by 10 cm section of the chest wall, including underlying rib, sternum, and pericardium was resected. The defect was reconstructed with a vertical rectus flap, which is comprised of abdominal skin and subcutaneous tissue surviving on the blood supply coming from the underlying, rotated rectus muscle of the opposite side (Illustrations 1-2).

Her post-operative course was complicated by ventricular arrythmias. However, these resolved and the patient has had complete healing of the chest wall without respiratory compromise.

CASE TWO

The patient is a 60-year-old white female who is a chronic smoker. In 1964 she underwent a right thoracotomy for benign duplication of the esophogus. In 1977 a radical mastectomy was carried out for cancer of the right breast. She presents with recurrent cancer of the chest wall along the incision documented by biopsy. There was no other evidence of metastases.

* Address correspondence to Dr. Hagerty at 159 Rutledge Avenue, Charleston, S. C. 29403.

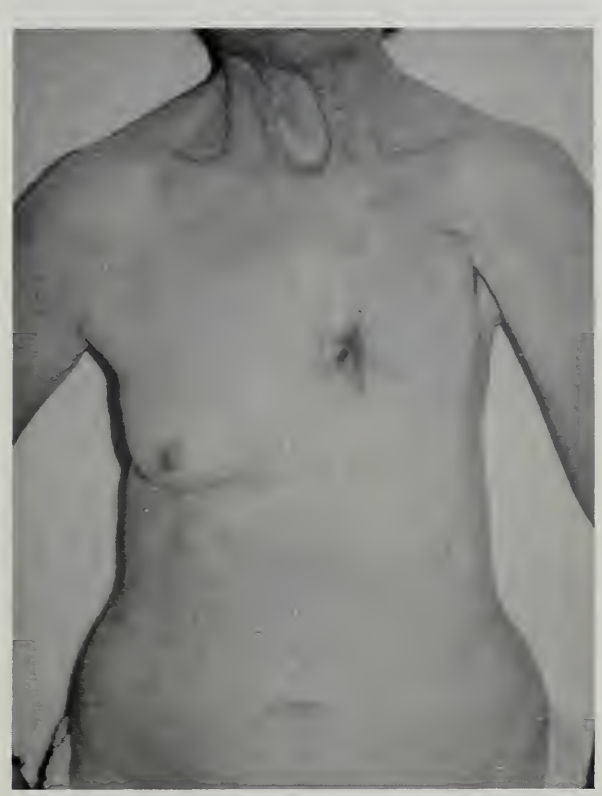


ILLUSTRATION 1: AP view of patient presented in Case 1 with radiation necrosis of chest wall.

A transverse rectus abdominis flap was surgically delayed and 12 days later the patient underwent wide excision of the chest wall recurrence including resection of the underlying fourth and fifth ribs and parietal pleura. The defect in the chest wall and pleural cavity was closed with anterior rectus sheath and with the contralateral rectus muscle now positioned in the pleural cavity (Illustrations 3-7).

Post-operatively the patient did well and was able to return to work. However, two months later, the lower abdominal incision became infected and this required hospitalization. The infection cleared with the use of parenteral antibiotics and the patient was discharged shortly



ILLUSTRATION 2: Post-operative view of patient presented in Case 1 after resection of chest wall and reconstruction of defect with vertical rectus flap.

thereafter. Six months later the flap was surgically contoured to obviate the need for breast prosthesis.

DISCUSSION

Successful reconstruction of chest wall defects requires preservation or restoration of chest wall stability while obtaining an aesthetic unit that is acceptable to the patient. Use of muscle flaps, including the rectus flaps, has been well documented,[1-4] and considerations of the different methods are presented in Table I.

The latissimus dorsi and pectoralis muscle flaps have proven to be very reliable. However, in these two cases, conditions prevailed where alternatives were preferable. In both cases the patients had undergone radical mastectomies placing the thoracodorsal pedicle at risk. In addition, in the second case, a previous thoracotomy compromised the use of a latissimus dorsi flap.

In Case One, the defect is in the medial chest wall involving the sternum. The rectus muscle is strategically located so that such a defect can be easily closed with the vertical rectus flap.[5]

The Transverse Rectus Abdominis Myocutaneous (T.R.A.M.) flap[6] was used in the second case because of the more lateral position of the defect in the chest wall. The T.R.A.M. flap was delayed to increase the blood supply and to evaluate the extent of the flap's survival. If the flap did not survive, the chest wall defect could then be reconstructed with omentum and the abdominal tissue



ILLUSTRATION 3: Frontal view of patient with recurrent cancer along the incision line presented in Case 2.

would then be discarded and the defect closed as in an abdominoplasty.

When using the T.R.A.M. flap for breast reconstruction, delay should be considered for those patients of increased age, a strong smoking history, and other problems where the vascularity may be compromised.

The pleural defect can be reconstructed with the anterior rectus sheath which fits nicely into the deficient chest walls, thus obviating the need for any alloplastic material. The patients cited in these two cases had no permanent respiratory compromise and no problems in the reconstructed site.

SUMMARY

Two cases are presented where chest wall defects are reconstructed with rectus abdominis musculocutaneous flaps. The delay phenomenon is shown to be of help to increase the survivability of flaps when the vascular supply may be compromised. We have seen a higher infection rate in the donor site when the flap is delayed. However, other problems, such as hernia formation, have been unusual.

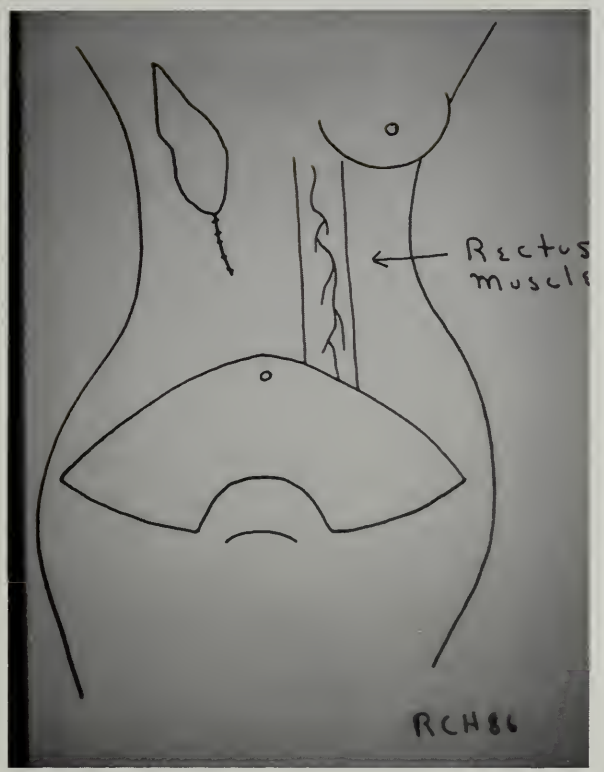


ILLUSTRATION 4: Line drawing showing defect, the rectus muscle, and the abdominal flap.

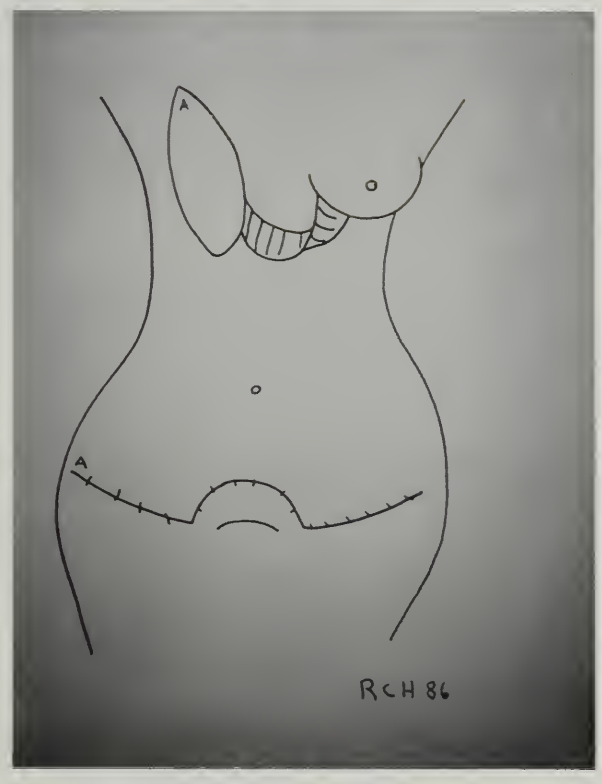


ILLUSTRATION 5: Line drawing showing reconstruction of chest wall defect with anterior rectus sheath and T.R.A.M. flap.



ILLUSTRATION 7: Lateral view of patient presented in Case 2 showing projection of T.R.A.M. flap reproducing the breast mound.



ILLUSTRATION 6: Frontal view of patient presented in Case 2 after reconstruction of chest wall defect with T.R.A.M. flap.

Reconstruction of the chest wall with the anterior rectus sheath was also described. The rectus muscle flaps with their islands of skin and subcutaneous tissue are reliable and versatile and greatly facilitate reconstruction of this challenging area. □

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Table I
METHODS AVAILABLE FOR CHEST WALL RECONSTRUCTION AND THEIR COMPARISONS

	BLOOD SUPPLY	ARC OF ROTATION	DONOR SITE DEFECT	SURFACE COVER	OTHER
Latissimus Dorsi M.C.F.	May be divided by previous breast surgery	Lateral chest wall and sup. medial	Prominent scar of postero-lat. thorax	Split graft tissue --- back skin	No muscular weakness
Pectoralis Major M.C.F.	Usually undivided	Upper chest wall (limited)	Scarring and contoural defect ant. chest wall	Split graft over muscle	Some loss of shoulder strength
Omentum	Usually undivided	Limited in thickness	Abdominal scar	Split graft over omentum	Possible intra-abdominal complications. Synthetic mesh needed for chest wall. Lacks substance.
T.R.A.M. Flap	May be divided by previous abdominal surgery	Entire chest wall	Low transverse abdominal scar, improved abdominal wall contour.	Extensive skin & subcutanous tissue--- Abdominal skin: breast contour reconstruction	Fascial covering available to recon struct chest wall defect
Vertical Rectus Flap	May be divided by previous abdominal surgery	Medial and Inferior chest wall	Vertical abdominal incision	Extensive skin & subcutaneous tissue	Fascial covering available to recon struct chest wall defect

OVARIAN HEMORRHAGE IN A WOMAN RECEIVING ORAL ANTICOAGULANTS*

M. KATHLEEN WILEY, M.D.
MARK M. ANDERSON, M.D.

The use of anticoagulants in the treatment of thromboembolic phenomena is a well-established therapeutic modality. With continuing advances in both medicine and surgery, an increasing number of premenopausal women are maintained on these drugs. While many of the bleeding complications associated with anticoagulants have been delineated in recent review articles,[1, 2] little emphasis is placed on an unusual complication in this subgroup of patients.

Hemoperitoneum secondary to ovarian hemorrhage is a well-established complication of anticoagulant therapy. More than 50 cases have been reported,[3-7] and an even larger number probably go unreported or undetected.[5] In most cases, the diagnosis is not considered preoperatively. This diagnosis must be considered promptly in the evaluation of abdominal pain in premenopausal women on anticoagulation therapy since early diagnosis will decrease morbidity and frequently preserve reproductive function.[4, 8, 9]

The following is a typical case.

CASE REPORT

A 35-year-old black female gravida 6, para 6, abortus 0 with a past history of recurrent pulmonary emboli was maintained on continuous anticoagulation with coumadin for over two years. She experienced a single episode of gross hematuria in March 1985, when her prothrombin time was 33.7, (normal control 11-13.2). On May 15, 1985, she was seen complaining of acute abdominal pain of 24 hours duration. The pain was periumbilical, sharp, stabbing and constant, and the pain radiated to her lower back and rectum with exacerbations and remissions. She complained of fever but she denied chills, cough, nausea, vomiting, diarrhea, melena, hematuria or symptoms of urinary tract infection. Her last bowel movement was normal on the morning of presentation. Her last menstrual period began on April 30, 1985, and was normal. Her only previous surgery was a bilateral tubal ligation in 1980.

Physical exam revealed a blood pressure of 140/100, pulse 108, temperature 98.8, respirations 16 and unlabored. Normal HEENT exam. Heart sounds were normal and lungs were clear. Abdomen revealed positive bowel sounds, without hepatosplenomegaly or masses. There was diffuse tenderness to palpation with increased tenderness in the periumbilical area, and in the right lower quadrant. The abdomen was soft with voluntary guarding and mild rebound tenderness in the right lower quadrant. On pelvic exam the cervix was without tenderness on manipulation. There was some mild tenderness in the right adnexal area. The uterus was small and firm. The stool was brown and heme positive. Admission hematocrit was 33 percent with a PT of 22.1 and a PTT of 34.6. EKG and chest x-ray were normal. Urinalysis was normal.

HOSPITAL COURSE

After admission the pain continued to progress during her hospital course and it became more cramping in nature and localized to the right lower quadrant, and continued to radiate into the rectum. Several hours after admission she was evaluated by a gynecologist and a fullness was detected in the right adnexa. A culdocentesis revealed 2 cc of blood and clots. The patient's hematocrit dropped from 33 percent to 21 percent in the first few hours of hospitalization. Following four units of fresh frozen plasma, an emergent abdominal/pelvic CT scan revealed a moderate amount of intraperitoneal fluid and an abnormal mass within the pelvis displacing and surrounding the inferior aspect of the uterus. The findings were consistent with acute bleeding. The patient's symptoms gradually resolved over the next 24 hours. Pelvic exam at discharge revealed some

* From the Department of Medicine, Medical University of South Carolina, 171 Ashley Avenue, Charleston, S. C. 29425-2224.

fullness in the cul-de-sac but no discrete masses or tenderness. The source of the patient's bleeding was attributed to a corpus luteal hemorrhage. Coumadin anticoagulation was continued because of the continued risk of recurrent pulmonary emboli.

DISCUSSION

Corpus luteal hemorrhage may be considered a variant of normal ovarian physiology, as the follicle develops into the mature corpus luteum after ovulation.[10] In the majority of cases, bleeding is usually minor and self-limited, and, therefore, often not recognized clinically. However, in the presence of anticoagulant therapy, (even with levels in the therapeutic range),[3] ovarian hemorrhage often becomes an urgent clinical problem.[11]

As with our patient, ovarian hemorrhage usually presents with fairly abrupt onset of lower abdominal pain. Pain usually causes the patient to seek medical help within 24 hours of onset. In about one-third of the patients, severe pain is preceded for one to two weeks by an intermittent, crampy lower abdominal pain that is less severe than the acute episode. This probably represents hemorrhage into the corpus luteum, prior to rupture. Nausea, vomiting and diarrhea may occur as a result of peritoneal irritation. Pain may be referred to the shoulder or rectum.[3, 8, 9] In one large study of corpus luteal hemorrhage, 66 percent involved the right ovary, 32 percent the left. Most occurred on days 20-26 of the cycle with only five out of 173 occurring in the first 14 days. In many cases there was a delay of menses for one to two weeks.[8]

On examination, there is usually a soft flat abdomen with normal to hyperactive bowel sounds and rebound tenderness. Pelvic examination generally reveals an adnexal mass.[4, 5, 11]

A serum BHCG, culdocentesis and pelvic CT scan or ultrasound are important in establishing the diagnosis of ovarian hemorrhage. The serum BHCG is necessary to exclude a ruptured ectopic pregnancy, which frequently has a similar presentation. Culdocentesis often yields clotted and unclotted bloody fluid, usually with an hematocrit of 12 percent or less,[9] another important difference from an ectopic pregnancy. Pelvic CT scan or ultrasound will reveal blood in the cul-de-sac and may delineate an ovarian hematoma as the probable site of bleeding.[12]

Once the diagnosis is made, reversal of anticoagulation with Vitamin K or fresh frozen plasma may be all that is necessary. However, many patients will require laparoscopy or laparotomy for definitive diagnosis and/or control of bleeding.[8, 9] When the acute situation has resolved, these patients will require careful follow up since studies report a 30 percent recurrence rate in women on anticoagulant therapy.[4, 7]

SUMMARY

Ovarian hemorrhage is a well-established complication of anticoagulation in premenopausal women. However, this complication is rarely mentioned in reviews of drug complications. Since early diagnosis decreases morbidity, ovarian hemorrhage must be considered early in the evaluation of acute abdominal pain in women receiving anticoagulants. □

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SCMA NEWSLETTER

August, 1986

SCMA LEADERSHIP CONFERENCE, SEPTEMBER 17, 1986

As announced previously, the second annual SCMA Leadership Conference will be held on Wednesday, September 17, 1986, in Columbia at the Sheraton Hotel at I-20 and Bush River Road.

Gubernatorial candidates *Carroll A. Campbell, U. S. Congressman, Fourth District; and Michael R. Daniel, Lieutenant Governor of the State of South Carolina,* have been invited as special luncheon speakers.

Included on the program for the Conference is a panel discussion on tort reform in South Carolina by *Senator John Courson, SCMA President-Elect Charles R. Duncan, Jr., M. D., Ms. Susie Nickles, Manager, SCMA Health Policy Affairs, and Mr. Ed Poliakoff, Chairman of the S. C. Civil Justice Coalition.* Other topics to be addressed include membership recruitment, media relations, health issues for the 1987-1988 Legislative Session, updates on Medicaid and Medicare in South Carolina, and an organizational overview of the SCMA.

If you are a member of the Board of SCMA and its subsidiaries and affiliates, a county society President or President-Elect (or Vice President), a student or House Staff Section leader, or a member of the Auxiliary leadership at the state and county level, and have not received notification and a registration form, call the SCMA at 798-6207.

PLANS UNDER WAY FOR ADDED MEMBER BENEFIT

At the June, 1986 meeting of the AMA, SCMA staff attended a presentation about the AMA's Medical Payment System, a computerized method for filing insurance claims and receiving insurance payments. Using a simple phone terminal device provided at no cost to physicians, insurance claims are easily completed by responding to pre-programmed questions. The claims are then submitted electronically to the MPS clearinghouse and routed to the appropriate insurance company. Reimbursement is handled easily and efficiently through electronic funds transfer to the physician's bank account. The key to the MPS system is the magnetically coded plastic ID card which allows both physician and patient identifying information to be quickly verified at the time of service. This verification process not only reduces the chance for error but also allows claims to be submitted more quickly.

To physicians who are non-members of the AMA, the price of the MPS system is $.65 per transcation, and for AMA members the price is discounted to $.55 per transaction. The phone terminal device is provided free. The SCMA Board of Trustees has authorized staff to proceed with contracting with the AMA to provide this service to our members as an "Affiliate" of the MPS system. The AMA is meeting with the national BC/BS organization and with HCFA in order to secure their agreement to accept claims frcm this system. Further details will be announced as they become available.

AMA/SCMA YOUNG PHYSICIANS SECTION

With overwhelming approval, the AMA House of Delegates at its Annual Meeting voted to establish a new Young Physicians Section. The new section is an attempt by the AMA to offer physicians under 40 a more active role in organized medicine. Currently, only 29 percent of those physicians are members of the AMA By offering young physicians their own political forum, the AMA hopes it can broaden participation by young physicians as well as serve as a membership incentive.

Both the AMA and the SCMA previously created medical student and resident physician sections. However, AMA Executive Vice President, James H. Sammons, M. D., has said that "we get these people involved, but then once they start practicing, we send them home to their county societies and tell them that if they live long enough, maybe they can come back."

For details regarding the AMA Young Physicians Section, refer to the report in this issue of *The Journal by John C. Hawk, Jr., M. D., SCMA Delegate to the AMA.*

Meantime, the SCMA Board of Trustees, at its July meeting, voted unanimously to adopt this concept and has referred to the Constitution and Bylaws Committee the task of developing the appropriate wording for inclusion in the Bylaws which will be presented to the SCMA House of Delegates in 1987 for approval. At the same time, the Board voted to appoint and sponsor the attendance of a young physician Delegate and Alternate to the AMA Interim Meeting in December.

DHEC CRITERIA FOR X-RAY FACILITIES

Persons in South Carolina who apply ionizing radiation to humans must meet minimum criteria to qualify for state certification as of July 25, 1986, reports the S. C. Department of Health and Environmental Control.

The change in South Carolina's Code of Laws relating to the control and regulation of radiation sources was signed into law by Governor Richard Riley on May 26. DHEC will set minimum requirements for certifying operators of sources of ionizing radiation.

According to DHEC's Bureau of Radiological Health, there are approximately 2,500 X-ray facilities registered in the state. The law exempts from the certification requirements any person who was an operator on May 26, providing he or she applies for certification within 60 days of the effective day of the law, according to DHEC officials. Application forms have been sent to all registered facilities by the Bureau of Radiological Health.

For additional information, contact *Mr. John Pruett, (803) 734-4700.*

COUNTY MEDICAL SOCIETY VISITATION PROGRAM

If your county medical society has not yet scheduled a visit by SCMA President, *Walter J. Roberts, Jr., M. D.,* and would like to do so, please write or call SCMA Headquarters at P. O. Box 11188, Columbia 29211, or call 798-6207.

SCPA DONATES $1,500 TO SOCPAC

On July 7, *Donald Morgan, M. D., President of the South Carolina Psychiatric Association,* presented a check for $1,200 to the South Carolina Political Action Committee (SOCPAC). According to Doctor Morgan, the SCPA considered retaining a lobbyist independent of the SCMA lobbyist, and to make an attempt to impact legislation separately from SCMA efforts, but decided at their Annual Meeting that the SCMA would more effectively represent their concerns at the State House. The SCPA then launched a campaign among its membership for full participation in SCMA and in SOCPAC.

Randolph D. Smoak, Jr., M. D., Chairman of the SOCPAC Board, said of the contribution:

> "The South Carolina Political Action Committee appreciates most sincerely the South Carolina Psychiatric Association's efforts to encourage the full participation of their specialty society. We applaud the commitment of the SCPA as evidenced by their willingness to become involved in SOCPAC and the SCMA. It is my hope that other specialty groups will also be challenged by this effort to ensure that a single, strong voice is heard in Columbia on issues of concern to each of us in the medical community."

JUNE PRESIDENT'S PAGE TO APPEAR IN *AM NEWS*

At the request of the Senior Editor of *AM News,* permission has been granted that publication to reprint the June, 1986 President's Page which appeared in *The Journal of the South Carolina Medical Association.* Written by SCMA President, *Walter J. Roberts, Jr., M. D.,* and entitled "Pro-Activism -- But With Taste," it will appear in the "Other Opinions" section of an upcoming issue. Both Dr. Roberts and *The Journal* welcome the opportunity of sharing the President's opinions with physicians throughout the country.

UPCOMING IN THE JOURNAL

The September, 1986 issue of *The Journal of the South Carolina Medical Association* will address important topics in the field of Oncology, with specific emphasis on Oncology issues in South Carolina. Guest Editor will be Editorial Board member, *Frederick L. Greene, M. D.*

Future special issues are planned in the areas of pediatrics and cardiovascular disease.

PCF RE-LOCATES

Effective August 4, 1986, the South Carolina Medical Malpractice Patients' Compensation Fund address is 1612 Marion Street, Room 405, Columbia, S. C. 29201, telephone number (803) 737-6263.

CAPSULES...

Congratulations to the following physicians who recently were granted honorary membership status: *Lawrence N. Bellew, M. D.; William S. Scott, M. D.; George Black, M. D.; and E. Lowry Shuler, M. D.*

John C. Hawk, Jr., M. D., SCMA Delegate to the American Medical Association, has been elected Chairman of the AMA Council on Constitution and Bylaws. Dr. Hawk previously served as Vice Chairman of this important AMA Council.

The SCMA appointee to the newly-created Renal Dialysis Advisory Council of the Department of Health and Environmental Control is *Uriel X. Cullum, M. D.*, a Columbia Nephrologist.

The SCMA Board of Trustees has endorsed the candidacy of *Donald G. Kilgore, Jr., M. D.*, for membership on the AMA Council on Legislation. Members of this Council are appointed by the AMA Board of Trustees.

NEW TELEPHONE NUMBERS FOR MEDICAID PROBLEMS

The State Health and Human Services Finance Commission has furnished the following new telephone numbers and names of contact persons when problems with Medicaid claims arise:

SURGERY: (Cardiology, Cardiovascular Surgery, General Surgery, Neurosurgery, Orthopedic Surgery, Proctology, Thoracic Surgery and Urology): *Ms. Kathi Peeples (803) 253-6134.*

HOSPITAL BASED SERVICES: (Anesthesiology, Emergency Room Physicians, Infectious Disease, Nuclear Medicine, Pathology, Physical Medicine, Pulmonary Medicine, Radiology Therapy, and Radiology): *Ms. Darlynn Booker, CT, (803) 253-6134.*

PRIMARY CARE SERVICES: (Family Practice, General Practice and Rural and Comprehensive Health): *Ms. Marsha Marze (803) 253-6134.*

INTERNAL MEDICINE AND CHILD HEALTH: (Family Planning, Gynecology, Internists, Neonatology and Pediatricians): *Ms. Daisy Myers (803) 253-6134.*

MATERNAL CARE (Assigned to HRCP) (Obstetricians): *Ms. Cathy Rollings (803) 253-6179.*

SECONDARY CARE SPECIALTIES: (Allergy, Ambulance, Dermatology, Endocrinology, ESRD Clinics, ENT, Gastroenterology, Hematology, Nephrology, Oncology, Ophthalmology, Podiatry, Psychiatry and Rheumatology): *Ms. Sandy Baker (803) 253-6134.*

The Director of the Division of Primary Care at HHSFC is *Mr. Ken Kamis,* who can be reached at (803) 253-6134.

PETER PAN STUMBLES

H. RAWLING PRATT-THOMAS, M.D.*

More than one million people have had bypass surgery. About four million more suffer from coronary artery disease and may one day face the bypass dilemma. I have at least 10 friends or professional associates who have had the procedure. I wish to prepare you. Much of surgery is designed for the purpose of exorcising an area of inflammation or a tumor. Bypass surgery is not only remedial, it is preventive medicine, designed to forestall one's demise by vascular engineering; by the installation of conduits to guarantee the nourishment of the heart muscle.

James Barrie's play presents Peter Pan as an idyll of boyhood triumphant, among other things, over the decrepitude of old age in the form of Captain Hook. This was a prototype which I had assumed in the eyes of my family and even by myself. Those of you who have been to see the play remember Peter Pan gliding about the stage supported by invisible wires. I was gliding through life until brought to earth in a resounding crash. Only after I had recovered did a friend substitute the gentler word stumble for the more catastrophic counterpart.

Some months before, following a physical examination, I remember jestingly asking my physician what diagnosis he was going to append to the Medicare form as he had found nothing amiss. Little did I know! The poet proclaims "I am the master of my fate, I am the captain of my soul." Nothing could be further from the truth.

My medical debacle announced itself by three attacks of pain between my shoulder blades, not severe, but disquieting. My physician did not buy osteoarthritis. The inevitable occurred. Dressed in country clothes and sneakers, I walked the medical version of the I-26. I had figuratively just reached Goose Creek on this moving ribbon on the way to Columbia when my interscapular pain recurred. The moving highway stopped. My physician, a close friend and former student, remarked "This is a reversal of roles, but, Professor, you have just flunked the stress test. In the next few hours I want you to decide whom you want to do the angiogram and in what hospital."

I suddenly felt like the pebble in David's sling shot. I was being catapulted into a decision-making process on a celestial level. I was reminded of the television advertisement where the buyer, seduced by various emoluments, has to be restrained from accepting the offer too early in the game. "Not so fast," the huckster counsels. Not so fast, indeed!

I returned home with a bit of repetitive gibberish pounding in my head "when the S-T segment falls, look out for squalls." This was 10 a.m. I was in the hospital at 1:00 p.m. Angiogram at 4:00 p.m. Most of my physicians had been former students, certainly an advantage, but conducive to a degree of jocularity and bonhomie which was not always reciprocal. When I was rolled into the cath lab the angiographer remarked, "Well, P-T, I've waited for 30 years to get even with you for that course in Pathology." I thought he was carrying his vengeance too far when my heart stopped beating for about seven seconds during the procedure and I awoke to find them pounding on my chest and yelling "cough."

How often in the ensuing days was I to contemplate the heart's most unique characteristic, its indomitable will to beat, and thankful for it too. It transported me back to the days of physiology in medical school, when on a dreamy spring afternoon the isolated turtle heart continued its inexorable beat as various chemicals were applied and tracings made. Most of all, it heartened me to know that when the cardiac surgeon lulled my heart to sleep with cold and chemicals, he would again be able to re-establish the complicated choreography of contraction after the delicate anastomoses had been done.

Needless to say, the surgeon did get my heart pumping again after the triple bypass. The anesthesiologist, another former student, wanted to know what was the last thing I remembered. I recall being spread-eagled beneath two glaring bluish-white moons while Lilliputians strapped down my extremities. I knew the endotracheal tube was being placed and the jugular vein pre-

* Department of Pathology, Medical University of South Carolina, 171 Ashley Avenue, Charleston, S. C. 29425-0686.

pared for canulation — then, thankful oblivion. I knew what was going on, but didn't care. Is it better to know? Does being a physician make such an operation better or worse? Infinitely worse! Knowing the hazards, being aware of the risks maintains one in a state of perpetual trepidation. Every twinge is viewed as an omen of dire consequence. Will the first visit to the bathroom presage that fatal pulmonary embolus that you have so often lectured about and so frequently demonstrated at autopsy? Why do I have fever? Pneumonia? Infection in the operative area? A constant litany of Why? Why? What?

It is no means over after you have paid your price on the altar of the surgeon's table. Not by a long shot! In fact, the postoperative ordeal is of greater magnitude than the preoperative period, particularly if the operation was performed with dispatch. "If it were done when t'is done, then t'well if it were done quickly." From the beginning to finale had taken less than 48 hours. If I had been allowed to go home for Thanksgiving, I might have opted for aspirin and Procardia. My cardiologist, another former student, stated "It would be too much of a blot on my escutcheon to allow my professor of Pathology to go home and die."

After the most pervasive and invasive operative procedure ever devised, the physical and psychological trauma persists. The physiologic effects of quantities of heparinized blood and anesthetic agents have not to my knowledge been well described. A bypass operation is the most effective diet regimen ever devised. One's mouth may be only adequately described as a primitive zoo — the very idea of food is repulsive. I could not abide the smell of whiskey for two months. Even iced tea tasted like molten tin. I petulantly asked a nurse why the kitchen couldn't prepare iced tea. She said it wasn't the kitchen it was the heparin. I asked the surgeon about this. He was not aware of any cause and effect. Concerning the effect on the brain there can be no doubt.

I spent the initial part of my convalescence in a ricefield. It so happened that there was one of Alice Huger Smith's paintings of a Low-Country ricefield at the foot of my bed. My disembodied mind transported me there while I vainly searched for ducks. I dreaded the nights, abnormally long; the phantasmagoria with which I was afflicted transformed furniture and shadows into fantastic and frightening shapes often with an oriental flavor. I visited Japan frequently, played the stockmarket there and was infinitely reassured when the nurse who periodically appeared was not dressed in a kimono. As in Kubla Khan, I floated on a sacred river down to a sunless sea. I subsequently suffered from insomnia for many weeks.

Besides dissolving the myelin sheaths in your brain, anesthesia alters one's temperature gauge. It resets your thermostat. For over two months I couldn't get warm. We had the highest heating bills ever. I never wear sweaters, but I bought several, even one like President Carter used to wear and wore them out. The climax of our married life occurred one morning when feeling as delicate as the finest porcelain and just as fragile I eased myself onto the stool in the bathtub and asked my wife to turn on the shower. Dutiful as ever she did. It was the cold water and in December, mind you. The shock was such I knew she had decided to settle my estate without further ado.

There were episodes that were grimly humorous. Except for fluids I did not eat for days, eventually savored a poached egg. It arrived without the toast. Imagine it, a poached egg without toast. Every morning at "first light" the nurse would trundle a scale into my room, not a compact modern device, but one appropriate for weighing potatoes or perhaps a bale of cotton. I surmised that if I went into acute congestive heart failure that it would be detected by the ponderous scales as I was otherwise losing weight steadily.

Although my hospital bed could be adjusted to do everything but flip over by the touch of button, the problem of sliding down to the foot of the bed was never solved. To be rescued from a crumpled heap at the foot of the bed required that two hefty nurses grab me under each arm and hoist me towards the head. Not much of a feat you say; except that I was certain that each such maneuver was going to offer for inspection the contents of my chest.

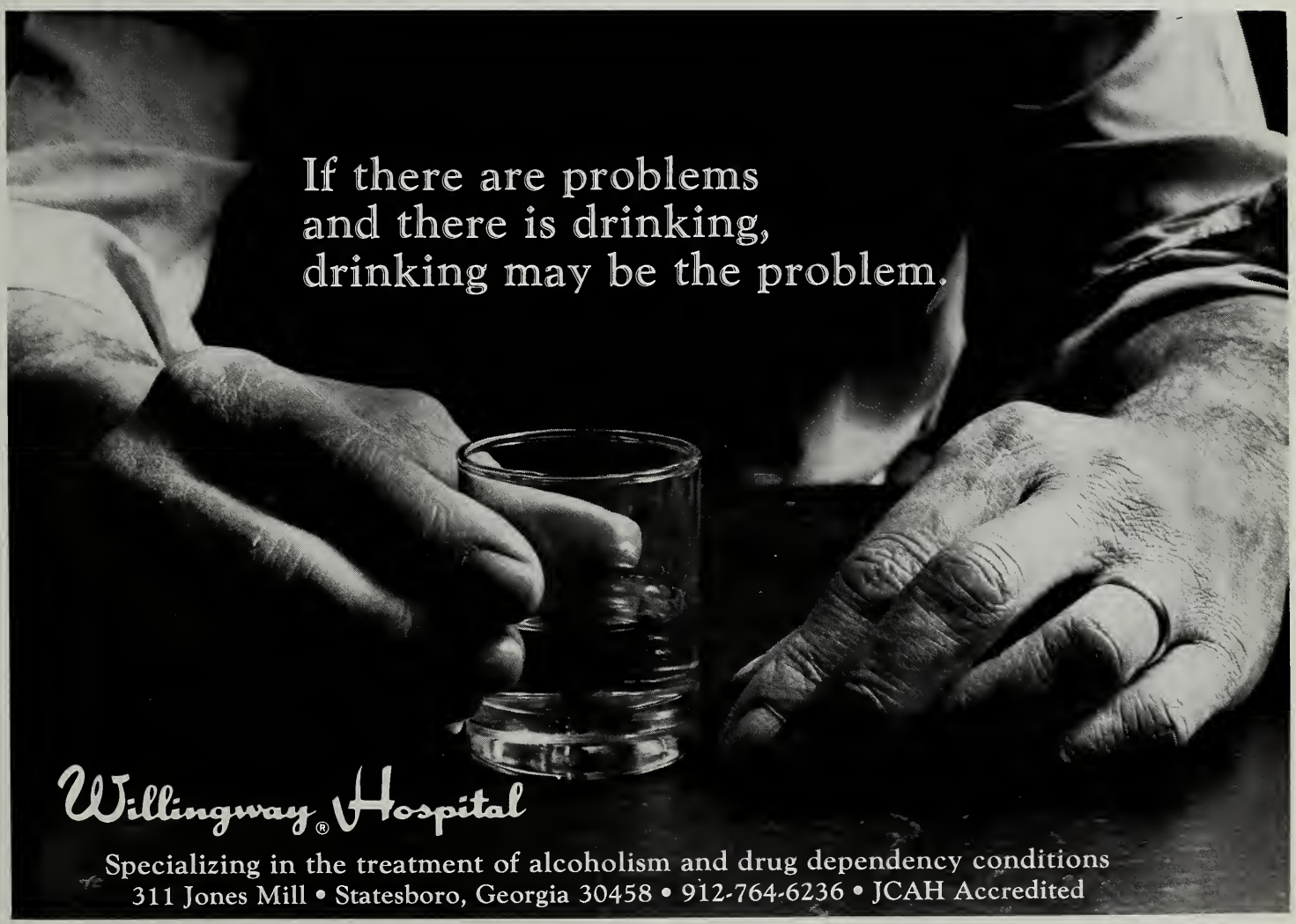
It has been observed that sex on the counterpane is so superior to sex in a book that it is surprising that anyone wishes to write about it. Contrarywise, the same may be said for a cardiac bypass. It is such an overwhelming physical and psychologic ordeal that only an innate masochism would stimulate one to write or talk about it.

I feel compelled to do so, a cleansing confessional perhaps, an act of witness, testimony that as bad as it may be, the alternative is worse. I have learned many lessons. I believe there is "a divinity that shapes our ends, roughhew them how we may." I have been in the physicians' study group at Harvard for several years, one purpose of which is to determine if aspirin prevents heart attacks. My personal evidence is in. With 95 percent occlusion of the LAD, I would have a coronary thrombosis and myocardial infarction of massive proportions if the anti-thrombotic action of aspirin had not been in effect. I have always enjoyed life. I relish it now.

I love Daylight Saving Time; I make use of every moment of it.

In the Book of Common Prayer of the Episcopal Church, there is in the communion service a sentence that in part reads "all of those in this transitory life." "Transitory life." As I read I look about me at all the young people. The phrase does not mean to them what it means to me. I doubt if it has real meaning, certainly nothing that is comprehensible on my level.

Bypass surgery may leave one a psychological cripple. The decision to return to work may be agonizingly complex. It was not for me. I find contact with medical students and residents stimulating, the making of a difficult diagnosis challenging and satisfying. I have achieved a balance. I take time to smell the roses and to weed the squash. To achieve a balance. Isn't that what life is all about? □



THE CHANGING PRACTICE OF MEDICINE . . .

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THE ANNUAL MEETING OF THE AMA — CHICAGO, JUNE 1986: REPORT OF THE SCMA DELEGATION

JOHN C. HAWK, JR., M.D.*

This prologue will deviate from the format we have used in most recent reports of the SCMA Delegation to the AMA House of Delegates. I am prompted to this by my phone conversation with Marion Burton, Speaker of the SCMA House, who attended an AMA meeting for the first time. When he called me a week after the meeting to give me his thoughts on the most important actions of the Reference Committee which he attended, he voiced three things: (1) genuine appreciation and even delight at having the opportunity to attend; (2) his impression that he had witnessed in action one of the most democratic bodies in the world; and (3) his surprise at how much hard work is put in by delegation members both at the meeting and in preparation for it. These are feelings that I have heard before, actually from almost every person attending a House of Delegates meeting for the first time. I felt them myself at my first meeting as part of the then smaller but much less organized and cohesive delegation.

I decided to look again at the motivations of those who attend year after year, as well as those going for the first time. First of all, we obviously must enjoy it and we do indeed consider it a privilege and honor to be chosen to represent the SCMA. If we did not enjoy it, we would certainly be foolish to attend, because it does entail hard work, not only at the meeting but before we go and to some extent after we come back, as in the preparation of this report. We are also always mindful that twice a year we must take a full week away from our practices. Even with understanding and supportive partners or associates at home, there is still the matter of "paying back" the time, as well as the undoubted loss of income. When we are fortunate enough to have our wives accompany us, the meeting becomes an added pleasure, but in the many times when they can't be present, we then have the matter of assuring that our families are not short-changed by our participation in the AMA meetings.

So why are the delegation members there? Perhaps in some ways this is an "ego trip," for after all we are being afforded the opportunity, expenses largely reimbursed, to be a part of the deliberations of the most important medical body of the entire world. But that certainly is not all. I sincerely believe that there is a genuine sense of responsible dedication by each person. We feel that we are there to represent the physicians of South Carolina, to make their voice heard at a national level, and to participate in decisions that may be far reaching for medicine as a whole. All of the members of your delegation have previously given years of service to organized medicine at the county and state levels. We do not take this responsibility lightly. We sincerely hope that we have represented South Carolina responsibly and effectively.

THE DELEGATION

The SCMA delegation in June included the following: Waitus Tanner, Don Kilgore, John Hawk, delegates; Randy Smoak, Euta Colvin, and Charlie Duncan, alternate delegates; Ken Owens, alternate delegate-elect; Walt Roberts, President; Marion Burton, Speaker of the SCMA House; and Bill Mahon and Barbara Whittaker, staff. We were pleased that Saundra Smoak, Dorothy Colvin (and two Colvin grandchildren), Nancy Hawk, Nancy Roberts, and Pat Duncan could join us and we were sorry that other wives could not be present. As at past meetings, we were especially proud of our delegation to the AMA Auxiliary Convention, and we were delighted to be with them when time permitted. We congratulate Sheila Davis on her election as a Director for the southern region. She will serve in this capacity for 1986-87 on the Board of Directors of the AMA Auxiliary.

* 30 Bee Street, Charleston, S. C. 29403.

HOUSE OF DELEGATES ACTIONS

The House of Delegates was the largest ever, with 391 seated delegates, of whom 313 represented state medical associations, 69 represented national medical specialty societies, and nine were section and service delegates. The *AM News* of June 27-July 4 has detailed reports of most of the actions taken by the House of Delegates so I will highlight only a few of the most important. Membership, Medicare, and Physician Manpower head the list.

MEMBERSHIP ISSUES

Keenly aware of the importance of increasing membership as a means to providing more effective representation of the entire medical profession, the House of Delegates took the following actions:

1. Overwhelmingly approved the setting up of a *Young Physician's Section* to provide greater representation for physicians under the age of 40 or in their first five years of practice. This Section will hold a meeting before each House of Delegates meeting, with one official voting delegate from each state, but with the meeting open to all who meet the criteria specified above. The Section will consider issues that are of particular importance to young physicians and will in turn be represented in the AMA House of Delegates by a Section delegate with an alternate. Bylaws were approved to accomplish this aim.
2. At the other end of the age spectrum, the House recognized the rising number of physicians who are retiring early, and adopted a provision (effective in 1987) that physicians who are under age 70 *and* fully retired, would pay only 20 percent of regular dues.
3. Endorsed again the Peer-to-Peer Physician Outreach Program whereby delegates and alternates will personally solicit membership in the AMA by state association members who are not now AMA members. This program is currently in full swing.

In addition, in conjunction with the House of Delegates meeting, a National Forum for Employed Physicians was held on June 14 for the first time. This was in response to the recognition that more and more physicians are now "employed" in various capacities and by various organizations, rather than being Fee-for-Service solo practitioners.

MEDICARE

The House of Delegates expressed deep concern about the Masssachusetts law that requires Medicare participation as a condition of licensure, and voted to provide AMA expertise and assistance to all states in which similar initiatives have been proposed or are pending. Also, in regard to Medicare, the House adopted that portion of the South Carolina Resolution which asked the AMA to encourage physicians to continue to treat Medicare patients and to accept assignment *based on individual needs and circumstances*. The Reference Committee recommended and the House agreed not to approve the second Resolve which called on the AMA to publicize mechanisms that will bring patients into direct contact with Medicare carriers regarding undue delays or disputes over reimbursement. Your delegation felt that this latter issue was addressed satisfactorily in another Resolution (Substitute 20) which was adopted as follows:

> "RESOLVED, That the American Medical Association seek means by which the problem of delayed Medicare reimbursements for physicians' services can be ameliorated, and express its concern and displeasure to the Health Care Financing Administration (HCFA) about the practice of slowing payment of Medicare claims (including the recent consideration of a 28-day payment cycle), which would place an unwarranted financial burden upon the elderly, the practitioners and facilities which serve senior citizens; and be it further RESOLVED, That the AMA attempt to develop model state legislation to establish incentives and/or penalties among private and public third party payors toward rectifying the problem of delayed insurance reimbursements; and be it further RESOLVED, That reasonable interest should begin on uncontroverted claims not later than 30 days."

PROPOSAL FOR FINANCING HEALTH CARE OF THE ELDERLY

Report MM of the Board of Trustees, considered by Reference Committee A, of which Dr. Waitus Tanner was a member, presented an important proposal from the Board of Trustees,

Council on Medical Service and Council on Legislation. Recognizing that Medicare has serious limitations, this plan attempts to correct those deficiencies by basing the new program on a set of actuarially and fiscally sound principles. These three groups have worked on this report for two and one-half years. It is a far reaching proposal which undoubtedly may require some modifications. It was adopted by the House with only minor amendments as a major step towards providing a better basis for financing health care for the elderly.

Your delegation urges every physician to read, and indeed to study this important proposal.

Report K of the Board of Trustees was also considered in Reference Committee A and adopted in lieu of Resolution 34 (I-85) on "Restructuring the Medicare Law," submitted from South Carolina at the Washington meeting last December. This Resolution had been referred to the Board, and in turn considered by the Council on Legislation. Dr. Dan Brake, author of the Resolution, met with this Council. The Board report pointed out that three of the Resolution's objectives are already covered by AMA policy and proposals. The Board recommended and the House agreed not to support items two and four of Resolution 23 which stated: (2) The Medicare program should contain a guarantee that every beneficiary over age 65 may continue their medical insurance at a reasonable rate upon retirement; and (4) funds saved through the restriction of the Medicare program should be used to improve Medicare coverage. The potential problems entailed in these proposals were explained adequately by Report K. Future implementation of Report MM, discussed above, would, of course, obviate the needs expressed in Resolution 34.

PHYSICIAN MANPOWER

The House amended and adopted the final report of the AMA Task Force on Physician Manpower, which represented a comprehensive study of the physician manpower issue. Important recommendations from the Task Force came under seven headings:

1. That the AMA carry out extensive, ongoing analyses of physician manpower.
2. That the AMA encourage the U. S. Medical Education system to review data and analyses regarding physician supply and particularly its impact on the quality and cost of care. The Council on Medical Education was directed to monitor closely the relationship between the size of medical school enrollments and the quality of education programs. The AMA will encourage the repeal of any state laws mandating maintenance of specific enrollments at state supported medical schools. Maintenance of appropriate quality standards would be kept foremost at all times.
3. That the AMA more actively disseminate to the general public information about the changing characteristics of medical practice and the medical community.
4. That the AMA coordinate efforts with state medical societies to provide state legislators and administrators with information that will allow them to determine which health manpower policies are best suited for their state.
5. That the AMA work toward a more favorable geographic distribution of physicians.
6. That medical students be provided with appropriate information so that they can best make their choice of specialty training.
7. That the AMA institute programs that would assist physicians seeking a transition from full-time practice.

It was noteworthy that the House of Delegates added an important final recommendation: "That the AMA continue to support the enrollment and retention in U. S. medical schools of under-represented groups."

OTHER IMPORTANT ISSUES

Since the House considered over 86 reports, many of them lengthy and detailed, and 147 Resolutions, there were obviously many other important issues discussed and acted upon. A report of the Special Task Force on Professional Liability outlined the continuing activities of the Association in this field, giving an update on federal legislation, presenting a consideration of alternatives to traditional tort reform, and reporting AMA activities with numerous coalitions and the AMA response to allegations by the Association of Trial Lawyers of America. Also increased activities in risk management, and peer review and discipline initiatives were outlined. The House adopted a Resolution calling on AMA to provide state medical associations with informa-

tion concerning legal challenges to tort reforms in various states.

PRESIDENTIAL ADDRESSES

Outgoing AMA President, Dr. Harrison L. Rogers, Jr., of Atlanta, Georgia, in his final address to the House, cited a number of ways in which medical practice has changed and in which the AMA has responded to such changes. He particularly urged physicians to show society that they are primarily concerned that the patient receive the highest possible quality of care and that they demonstrate their advocacy for their patients and the medical profession by contributing both time and talent to the betterment of the community.

Dr. John J. Coury, Jr., of Port Huron, Michigan, who was sworn in as the 141st President of the AMA, stressed in his inaugural address that the medical profession must maintain its "rightful position as a leader in making this nation's health policy." He emphasized at the same time the profession must "become more committed to taking forceful action against physicians who are 'sore spots' in our profession."

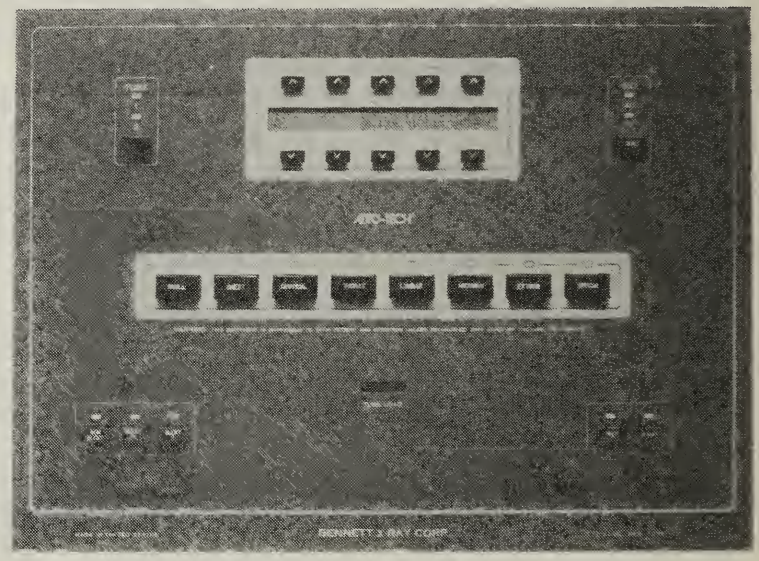
APPRECIATION AND INVITATION

Your delegation again expresses its appreciation for the privilege of representing the SCMA. We also conclude our report again with an exhortation and an invitation: If you are not already a member of the AMA, please join *now* and keep your membership. Keep informed about what is going on in medicine by reading the *AM News* and the other publications of the AMA. Come to an AMA meeting and be a part of the action yourself. Not only can you see the House of Delegates in action, but you can also *participate* in the Reference Committee discussions, which are open to all. Finally, please visit with us in the South Carolina Hospitality Suite. You will always be welcome. □

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Vol. 6, Issue No. 8 August 1986

DIRECT INVESTMENTS: WHAT'S IN STORE?

New areas of investment make the direct approach an exciting alternative for many investors.

Over the last 15 years, the popularity of limited partnerships has grown tremendously, and they are now regarded as major investment vehicles by corporations and individuals. In the years since 1970, changes in the economy and revisions in the Tax Code have increasingly made these investments more income and appreciation oriented rather than tax motivated. The result has been accelerated public interest in limited partnerships and the development of programs designed to meet a variety of investor needs. In fact, according to the November 1985 issue of The Stanger Register, in the past few years, more money was raised to finance limited partnerships than the total raised for initial public stock offerings. This even included 1985, a year marked by tax uncertainties when approximately $11.5 billion was raised to finance public offerings, and approximately $8.7 billion was raised for private limited partnerships.*

1986 should be no different, despite the possibility of additional amendments to the Tax Law. While we cannot now predict what specific changes, if any, will be made, at least some revisions may be legislated before year-end. The House has already passed its version of a tax bill with some noteworthy provisions including:

A reduction to 38% of the maximum individual tax rate.

Repeal of the Investment Tax Credit (ITC).

Extension on the At-Risk rule to cover real estate. This means that real estate investors would no longer be able to claim deductions greater than the amount they are actually at a risk for in any program. (There will be an exception for certain third party financing such as bank financing.)

A significant lengthening of the depreciation schedule.

A phasing out of the depletion allowance for many oil and gas investments.

A significant limitation on interest deductions.

The alternative minimum tax (AMT) rate would be raised from the current 20% to 25% and additional tax preference items would be included in determining the AMT.

Regardless of what changes may take place, it is unlikely that Congress will forego its historical commitment to stimulating investments in selected sectors of the

economy through tax incentives. What will likely occur is that the nature of traditional direct investment programs such as real estate, oil and gas and equipment leasing will change somewhat, but new opportunities will be created within these and other areas, such as entertainment.

WHAT WILL HAPPEN?

As indicated above, public direct investments are increasingly being structured toward generating current income and capital appreciation and less toward tax benefits.

Private direct investment programs will continue to offer the higher write-offs, but these may not be as high as in previous years. However, programs will be even more economically motivated.

In addition, most firms are continuing to diversify its existing product lines and move into new, emerging, potentially profitable areas such as motion pictures, cable TV, manufactured housing communities, self-storage facilities and broadcasting.

Preservation of capital and safety of principal will continue to be target objectives. Wherever possible, credit enhancement and General Partner guarantees will be built into programs to ensure that operating goals are met. In addition, Hutton will continue to offer will-structured programs to investors. These programs base General Partner compensation on its performance in the management of partnership assets, contain low front-end fees and subordinate General Partner compensation to limited partner preferential returns. In this manner, incentives are created for management performance and risk can be reduced for the limited partners.

Many ERISA investors are increasingly turning to direct investments as an excellent method of diversifying their portfolios. Hutton currently offers programs that may meet the needs of these investors. These offerings can provide current return and the opportunity for capital appreciation, and many also contain safety provisions important to ERISA investors such as insurance and guarantees.

In addition, for investors interested in more heavily tax-advantaged products, 1986 may be an optimal year to invest as many experts believe that certain tax benefits such as depreciation offered in existing programs, including those begun in 1986, will likely to be grandfathered (i.e., subject to current laws). Moreover, the House and Senate are considering making the effective date of any tax legislation January 1, 1987.

To Be Continued Next Month.....

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If you would like to receive further information on any of the topics covered in this newsletter, please write to Martin Lefkowitz, CFP, E.F. Hutton & Company, Inc. , 2700 Middleburg Drive, Suite 200, Columbia, SC 29204; or Call (800) 922-1112.

Editorials

The two guest editorials which follow reflect the opinions of the authors and do not necessarily reflect the opinions of The Journal *or the South Carolina Medical Association.*

— CSB

THE LEONARD DOUGLAS MEMORIAL LECTURE

The Board of Directors of the South Carolina Institute for Medical Education and Research (SCIMER) decided at its recent meeting to sponsor an annual presentation at the April meeting of the South Carolina Medical Association, to be known as the Leonard Douglas Memorial Lecture. We feel that this is a fitting way to honor Leonard, our late president. We plan to sponsor the first such lecture at the annual meeting in 1987.

This event will be funded by the memorial fund established for Leonard through the SCIMER organization. We would like to increase this fund through additional donations. We do receive memorial gifts, and I encourage our physicians to consider making such gifts to SCIMER to be used for the stated purpose next year and also for additional projects that will be beneficial to the physicians of South Carolina and to their families.

This year, SCIMER provided four scholarships to medical students, two at each of our medical schools. This was accomplished in cooperation with our fine Medical Auxiliary, which has sponsored a scholarship program for several years. We would like to increase the aid we give these young people who are our colleagues of tomorrow.

Through their thoughtfulness and in memory of Dr. and Mrs. Henry Stuckey, we were able this year to award a substantial scholarship to a fine young man from Bamberg, who is a third year student at the University of South Carolina School of Medicine. There is no better way to honor our profession than in the manner provided by the funds granted the South Carolina Medical Association by Dr. Stuckey's will.

In making memorial or other donations, I would like all of our state's physicians and others to consider SCIMER. Let's make the Leonard Douglas Memorial Lecture a truly memorable event each year and let us increase the ability to help train the young people who follow in our steps.

Donations may be sent to: SCIMER, c/o The South Carolina Medical Association, P. O. Box 11188, Columbia, South Carolina.

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Chairman, Board of Directors,
South Carolina Institute for
Medical Education and Research

ORDERING A BLOOD ALCOHOL LEVEL IN THE EMERGENCY ROOM: A MEDICAL-LEGAL DILEMMA

The circumstances under which a blood alcohol level is to be obtained from motor vehicle drivers has recently become an issue in some of the emergency rooms and hospitals in South Carolina. Although the indications for obtaining such a level are clear-cut and well-defined in most situations, there are some instances in which "the patient" subtly becomes "the accused." The physician's role becomes blurred, with the potential for ethical and legal conflict.

Let us consider three situations in which a blood alcohol level may be indicated.

In the first situation, an injured driver presents to the emergency room with altered consciousness. The physician must differentiate head injury from alcohol intoxication. The clinical situation clearly justifies the obtaining of a blood alcohol level. Officers and courts may subpoena this laboratory result, just as they do any other medical records for which they have a legal need.

In the second situation, a driver has been arrested and accused of intoxication on the basis of a Breathalyzer test. Under the DUI Statutes of the State of South Carolina, the accused has the right to demand that a blood alcohol determination be made at his own expense.[1] When the result of this test is released to the accused, the laboratory is required by the statute to give a copy of the report to the officer. The hospital, through its emergency room and laboratory, has no legal obligation to provide this service inasmuch as it is beyond the scope of medical care. However, most hospitals offer this service for the convenience of the accused in this well-defined legal setting.

The third situation has multiple variations and presents more challenging problems for all parties. In this scenario, an injured driver is brought to the emergency room by the arresting officer, and the family or the lawyer for another injured person requests that a blood alcohol level be obtained from the driver. Due to this physical condition, the driver has not taken the Breathalyzer test. Therefore, this is the only opportunity to determine the driver's alcohol status. The emergency room physician may be "reminded" of this dilemma by the arresting officer, who then insists that a blood alcohol level be drawn. It is in this setting that "the patient" becomes "the accused" (or perhaps assumes a zebra-like combination of these two identities). The physician is forced into a risky legal and ethical decision.

If the physician believes that a blood alcohol level is indicated in this situation, then he has the medical right and duty to obtain it. Lacking such an indication, neither the physician nor the hospital enjoys the ethical or legal privilege to proceed with the test. In the doctor-patient relationship, the physician's charge is the treatment and healing of the patient based on mutual trust and confidentiality. The patient has the right to expect that when he releases his body to the care of a physician it shall be used solely for his benefit, and not for any community purpose — no matter how noble the cause — unless otherwise stated by law. On a practical basis, we as physicians already have sufficient problems with maintaining the sanctity of the doctor-patient relationship in the current professional liability climate without further complicating it by unethical misconduct in attempting to function as an arm of the law.

To obtain a blood sample solely for the public's benefit without the consent of the accused/patient is an assault and battery on that person which is clearly compensable under both state and national tort laws. Some lawyers suggest that lack of consent under these circumstances is merely a technical assault resulting in only nominal damages in the event of a malpractice suit. However, this advice is highly questionable in the situation in which the physician obtains the blood alcohol level solely for legal purposes. Such an intentional tort is not only a violation of the body but also of the patient's trust; the actual damages may be nominal but the potential for punitive damages is extraordinarily real. Obtaining a blood sample ostensibly for the patient's medical benefit but in actuality for use against the patient in a criminal action introduces a flavor of fraudulence.

The U. S. Supreme Court has held that blood drawn without or even against the patient's consent is not a violation of his constitutional rights under the Fifth Amendment, and that such test results may be used against him subsequently in a criminal action for DUI.[2] However, this holding does not abrogate the rights of a patient who sues the physician in a civil action for assault and

battery when the physician fails to obtain consent and fails to disclose the purpose of the test.

Our society is appropriately directing increasing attention to alcohol-related vehicular deaths and injuries through the MADD movement, strengthened DUI statutes, and DUI felony statutes. Pressures on physicians and hospitals to draw blood alcohol levels from accused persons disguised as patients will mount. Although we as physicians might conceivably escape the legal consequences, we nevertheless have the ethical duty to protect the sanctity of the doctor-patient relationship by prohibiting society's using medicine as a tool to perform its extra-medical policing functions, no matter how desirable the cause.

The solution to this dilemma is through state legislation. All of the arguments used and pressures applied against the emergency room physicians and hospitals by law enforcement officers, solicitors, and victims must be directed to the South Carolina State Legislature. A bill has been pending in the South Carolina Senate for the past two years without any action.[3] The bill essentially provides that in the event a Breathalyzer test cannot be performed due to the disability of the accused, the officer may order that a blood alcohol level be obtained.

Until this bill is enacted, the physician cannot and should not jeopardize or distort his role by either yielding to the pressures in isolated instances or by maintaining a routine practice of drawing blood alcohol levels on all vehicular accident patients.

Our society should properly maintain a division of responsibility. The greater extent to which physicians and hospitals are willing to assume the public's posture by drawing blood alcohol levels for legal purposes, the less pressure there will be on the state legislature to enact this most appropriate and necessary legislation.

William F. Fairey, M.D., L.L.B.
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REFERENCES
1. Code of Laws of the State of South Carolina #46-344.
2. Decision of the United States Supreme Court in Schmerber v. State of California 86 S. Ct. 1826, 384 U. S. 757 (1966).
3. Senate Bill 436, Committee Report, first read March 28, 1985.

LETTER TO THE EDITOR

To the Editor:

In the April issue in the SCMA newsletter there is a section entitled "Physicians cautioned regarding 'Living Will'." Our attorneys have strongly recommended that physicians not advise patients regarding living wills. Under the new statute, this advice could possibly be construed as coercion, etc. The above is advice given to physicians.

This sounds very strange to me. I think it is our duty to discuss with our patients what their wishes are in terminal situations. In my own practice I record in my chart what the patient's desires are. I often will bring this up myself and have a thorough discussion with the patient concerning what might happen and what their desires are in specific situations. I gather that throughout the country only about five to ten percent of the physicians know their patients' wishes. I have also gathered that the medical profession as a whole has advised us to discuss their wishes beforehand. For us to merely refer a patient to a lawyer and not discuss these very important medical decisions with the patient I think is wrong. I would like to see a much more thorough discussion of this advice from our lawyers. At present I will continue my present practice which I think is of benefit to the patients and clarifies what my course should be.

Sincerely yours,

Edmund R. Taylor, M.D.
1701 St. Julian Place
Columbia, S. C. 29204

ON THE COVER: DANIEL FLUD, M.D.

These essays, depicting "The Pictorial History of Medicine in South Carolina" began seven years ago. The attempt has always been toward preserving the fine points of medical history that so characterized the early physicians of our state. Much of the material used in these essays has been obtained from the Waring Historical Library of the Medical University of South Carolina in Charleston, South Carolina. From time to time we are proud to present essays and informative reports by contributing readers. The essay which follows was prepared by Edward West, M.D., of Charleston, a physician who shares a keen interest in the history of medicine. Dr. West has a particular interest in Confederate War physicians and the following essay is received from Dr. West with much appreciation.

"1860 was a year of decision for South Carolinians. The sectional debate of the preceding decades had reached its irrepressible climax as leaders from across the state met to consider secession. One of the delegates from the Colleton District was Summerville physician planter Daniel Flud.

The son of a Stono farm family, Daniel Flud was born in Charleston March 16, 1818. He graduated from South Carolina College in 1839 and from the Medical College of Charleston in 1842. His doctoral thesis, entitled 'Scrofula,' is preserved in the Waring Library. He established his residence on the outskirts of Summerville, practicing medicine, supervising the work of slaves on his farm, and raising a family.

He was chosen to represent his district at the secession convention in 1860 and was numbered among the 'sober, grave and venerable men, selected from every pursuit in life, and distinguished, most of them, in their respective spheres, by every quality that can command confidence and respect,' as a contemporary observed. They were a group of legislators and merchants, ministers and planters, judges and lawyers, and twenty-four physicians 'appealing to the Supreme Judge of the world for the rectitude of our intentions.' Seven of the group would die in combat within five years.

Events moved quickly in Daniel Flud's life after the convention. He joined the Rutledge Mounted Rifles in 1861. Later he experienced war as a cavalry trooper with the Charleston Light Dragoons before receiving a commission as Assistant Surgeon. He returned from the Virginia battlefields to serve as a military surgeon at Florence and then at Charleston where he supervised the smallpox hospital. Toward the end of the war, he was in the Sumter district, convalescing from typhoid, when Sherman began his advance through the Carolinas. Dr. Flud rejoined the army and served to the conclusion of the war.

After the war he returned to private practice in Summerville. He was a leader in the St. Paul's Episcopal congregation and was recognized as one who gave generously of his private resources to the poor. His home was heavily damaged in the earthquake of 1886. On this occasion he was offered monetary assistance from a community relief committee. In a letter dated October 16, 1886, the committee acknowledged Dr. Flud's declining the money mentioning that the offer was prompted 'under the conviction that the drain upon your private resources in ministering to the needy, which is always great, would be increased by the late earthquake, and that it may be indirectly helpful to you in that way.'

Dr. Daniel Flud died in 1896. A note, written by one of his daughters as a postscript to the letter from the community relief committee, is an eloquent summation of her father and this significant Carolinian:

'Am proud of this characteristic independence, practiced throughout a long and useful life.'

— M. S. Flud"

Essays relating to the pictorial history of medicine in South Carolina are solicited as well as family recollections, old photographs, medical memorabilia of the past, and other items that may further enhance our knowledge on this very interesting subject.

Thomas M. Leland, M.D., Ph.D.

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THURSDAY, SEPTEMBER 18, 1986

4:30 p.m. . . . . .Registration

7:00 p.m. . . . . .Social Hour

FRIDAY, SEPTEMBER 19, 1986

8:00 a.m.. . . . . .Registration and Continental Breakfast

8:30 a.m.. . . . . .Welcome and Call To Order – Richard Bright, M.D.

8:35 a.m.. . . . . ."Improving Relationships in the Hospital--The Key to Success and Survival" – Hugh Greeley

10:05 a.m.. . . . . .Refreshment Break

10:20 a.m.. . . . . ."Relationships in the Hospital: Trustee, Physician and Administrator Roles and Responsibilities" – Nancy Altman, Frank DeMarco and Walter Roberts, M.D.

10:50 a.m.. . . . . ."Ethical Concerns in the Hospital" – Nora Bell, Ph.D.

Noon. . . . . .Adjournment

12:30 p.m. . . . . .Golf Tournament

1:00 p.m. . . . . .Tennis Tournament

7:00 p.m. . . . . .Social Hour

SATURDAY, SEPTEMBER 20, 1986

8:00 a.m.. . . . . .Continental Breakfast

8:30 a.m.. . . . . .Call To Order – W. Ham Hudson

8:35 a.m.. . . . . ."Funded Programs for Healthcare: Their Impact on the South Carolina Healthcare Delivery System" – Allen Dobson, Ph.D., and David Murday, Ph.D.

10:05 a.m.. . . . . .Refreshment Break

10:20 a.m.. . . . . ."Techniques and Guidelines for Effective Lobbying" – Rex Carter, Senator Joe Wilson, Representative Dill Blackwell and Councilman Bruce Merchant Jr.

11:40 a.m.. . . . . .Conference Evaluation Session

Noon. . . . . .Adjournment

REGISTRATION FEES for the program are $95 per person and include the cost of the program and all materials, two continental breakfasts, two social hours and refreshment breaks. Spouse/Guest tickets may be purchased for the breakfasts and social hours at a cost of $5 per breakfast and $10 per social hour.

ROOM RESERVATIONS must be made no later than August 18 in order to receive the special conference rate, which is $98 per room, single or double. Because the room block includes 200 rooms, we cannot guarantee rooms at the Mariner's Inn at the special rate for more that the first 200 registrants. For reservations, contact the Mariner's Inn at 800/845-8001.

GOLF AND TENNIS TOURNAMENTS are planned for Friday afternoon for all registrants wishing to participate. Golf fees are $45 per person, and tennis fees are $14 per person.

FOR MORE DETAILED PROGRAM INFORMATION AND REGISTRATION/RESERVATION FORMS, contact Linda Haines or Doris Clevenger at SCHA, 803/796-3080, or Bill Mahon at SCMA, 803/798-6207.

THE PROJECT has applied for Continuing Education (CME) Category I AMA Physicians Award for physicians attending the program.

SOUTH CAROLINA MEDICAL ASSOCIATION

AUXILIARY

AMA AUXILIARY CONVENTION — CHICAGO — JUNE 15-18, 1986

When the 63rd annual session of the American Medical Association Auxiliary House of Delegates opened at 5:00 pm on Sunday, June 15, 1986, South Carolina was well represented by seven delegates: Susanne Black, M.D., Skippy Adkins, Jessie Little, Susan Brill, Mary James, Betsey Terry, and Madge Littlejohn. Alternate delegates were Saundra Smoak, Pat Duncan, and Nancy Roberts.

Bylaws, Organization, and Health Projects Reference Committee hearings were attended by the delegation; Skippy Adkins is a member of the national Bylaws committee. During the Monday afternoon session of the House of Delegates, General Officers for 1986-87 were elected. Sheila Davis (S. Perry) from Pinewood was elected to the Board of Directors from the Southern Region. Resolutions were passed in the House of Delegates on the following subjects: Education on Danger of Smokeless Tobacco Products; Education on and Prevention of Severe Injuries Due to Shaking a Child; Education of Reducing the Risk of Osteoporosis; Education of the Prevention of Skin Cancer; Promotion of and Involvement with the Healthy Mothers, Healthy Babies Coalition; Comprehensive Health Education Program (including the subject of tobacco) in Elementary and Secondary Schools; and Banning of or Health Warnings on Billboard Advertisements of Smokeless Tobacco Products. These programs are to be undertaken with the approval of and in cooperation with the corresponding state and county medical societies/associations.

Harrison L. Rogers, Jr., M.D. President, American Medical Association, brought us a most enlightening message on Wednesday, and he placed major emphasis on the importance of the following six topics:

(1) Medicare: The efforts of HCFA to comply with recent federal legislation to reduce the country's deficit does not appear to have been successful. A new system is suggested which, unlike HCFA's current method, will insure that Medicare will continue payment for many years rather than exhaust all funds by the year 2000.

(2) Manpower Programs: Dr. Rogers addressed the issue of "the glut" of physicians; however, he noted that this is a maldistribution glut relative to specialty and geographic area.

(3) Report of Self Regulation: Physicians need to focus on the quality of care patients should receive rather than the fear of litigation.

(4) Malpractice Crisis: State and federal insurance premiums are continuing to increase due to many unnecessary malpractice suits. Statistics reflect that the legal profession appears to have profited most from this crisis, not the patient. On the average, the patient only receives 28 percent of the settlement. The malpractice issue has created an unnecessary strain on the doctor-patient relationship.

(5) Professional Ethics vs. Business Ethics: With the ever-increasing structural changes in the medical profession (HMO's, PPO's, etc.) and state and federal regulations, many physicians have started focusing on the business aspect of medicine rather than the professional aspect. Dr. Rogers encouraged an end to this movement toward business, and all physicians to return to the ideals of medicine.

(6) Community Involvement: The physician has been given a high status within the community where he/she practices and therefore must take a concentrated effort to give back to the community which has been so good to him/her. Dr. Rogers recommended that the physician get reacquainted with the patient. Learn the patient's family history, not just the medical history but all factors surrounding the patient's socioeconomic history.

Rufus K. Broadaway, M.D., President, AMA-ERF, expressed appreciation for the efforts of all auxilians in raising monies for this worthwhile program.

Pat Durham from Texas was installed as 1986-87 President of the AMA Auxiliary.

Hopefully, we all returned home more knowledgeable.

MADGE F. LITTLEJOHN, President-Elect

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MEDICAL-DENTAL office space in new building available January 1, 1987. Near I-26 at the Irmo exit. 1,000-3,000 sq. ft. available for long term lease. *Call after 7:00 p.m. (803) 345-1226.*

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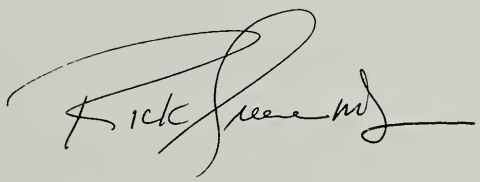
PERSPECTIVES IN CANCER CARE IN SOUTH CAROLINA: INTRODUCTION

FREDERICK L. GREENE, M.D.*

It is both an honor and a pleasure to serve as Guest Editor for this special issue of the *SCMA Journal* devoted to oncology and related topics of interest to us in South Carolina. In April, 1983, the first symposium dedicated to cancer topics was published by *The Journal* and served to highlight the involvement of many physicians in the state as well as the contributions of the South Carolina Division of the American Cancer Society. These commitments have continued and have been increased by the development of cancer community programs throughout the State as well as the ongoing commitment of individual physicians interested in both the clinical and research aspects of cancer.

It is appropriate to publish this edition of *The Journal* in September since this month represents Childhood Cancer Awareness Month, as well as serving as the traditional meeting time of the South Carolina Division of the American Cancer Society and the South Carolina Oncology Society. While these two major organizations represent a large cross section of both lay and professional personnel working toward the eradication of cancer in our state, the daily care given to patients in physicians' offices and hospitals throughout South Carolina represents the "grassroots" effect stimulated by a greater awareness of the specific problems experienced by cancer patients.

The scientific contributions in this edition of *The Journal* highlight the major oncologic problems that we face in our State and give an indication of the ongoing work being conducted by our colleagues. I appreciate their desire to publish in this edition and dedicate their work and all of our efforts to the 11,500 South Carolinians who will develop cancer in 1986, and who may, one day benefit by our endeavors.



— Frederick L. Greene, M.D.

* Number Two Medical Park Road, Suite 402, Columbia, S. C. 29203.

ON THE COVER: ELI GEDDINGS, M.D. (1799-1878)

After initiating his study of medicine under the apprenticeship method in Abbeville, Eli Geddings matriculated at the newly formed Medical College of South Carolina and became the first graduate of the institution in 1825. Geddings remained in Charleston to open a private school known as the Charleston Academy of Medicine where lectures were offered in the practice of Medicine and Surgery, Surgical Pathology, Practical Anatomy, and Operative Surgery. From 1831 to 1837, Geddings held the Chair of Anatomy and Physiology at the University of Maryland. In 1837, he returned to the Medical College of South Carolina when the Chair of Pathological Anatomy and Medical Jurisprudence was created for him. Geddings later held both the Chairs of Surgery and Medicine which stimulated an admirer to say "he (Geddings) filled every chair in the Medical College with equal capacity and was no less a master in the knowledge of drugs than he was in handling the surgeon's knife."

Two of Geddings' students, Thomas Waring and Samuel Logan, published lectures given by Geddings on the principles and practice of surgery. A portion of these lectures is devoted to "Malignant Growths" and gives a contemporary view of cancer treatment in the early decades of the Nineteenth Century. Geddings took the view that "Malignant Growth" had a local and "Constitutional" component which resulted in the cachexia experienced by patients. Geddings also recognized the rate of tumor growth is important, which was a forerunner of the same scientific concepts of doubling times used today. Throughout his lectures on Cancer, Geddings maintains the fatalistic view of his colleagues that all cancers are incurable and "the sufferer is soon relieved by death." Geddings, however, remains optimistic regarding cancer cure when he lectures, "Yet, may we not hope that the day is not far distant when the interest now bestowed upon the study of cancer may be crowned by success, and when, by having gained a thorough knowledge of its nature, characteristics, and symptoms, we may succeed in removing from the list of opprobrium by rendering its early detection certain, and its perfect cure easy and sure."

How contemporary Geddings' throughts remain 130 years later!

— Frederick L. Greene, M.D.

President's Page



FEDERAL HEALTH CARE DELIVERY CHANGES

Physicians who are in private practice should make careful note of two programs federal governmental agencies have instituted the past year or so. For better or worse, these may be the first of many efforts to get the feds, ultimately, out of the health care financing business.

In 1982, TEFRA opened avenues by which private health delivery systems — such as HMOs and PPOs — could join with programs which historically were run by the federal government — such as Medicare. These Competitive Medical Plans ("CMPs") represent "joint ventures" which allow private business to use funds heretofore used exclusively by the government — through its fiscal intermediaries — to pay health care costs.

Blue Cross/Blue Shield of South Carolina is now marketing such a program, called "Complete 65." Here, with HCFA's approval of the contract, the purchaser of the contract gives up his Medicare benefits (a somewhat difficult decision to make, I am sure). The amount of money dedicated by HCFA for his Medicare benefit is paid then to the "Blues" as capitation for this "Complete 65" plan; the Blues then add their finagling figure, which at present is another $40 per month. It is my understanding that the contract owner then has first dollar coverage for physicians, hospitals and most all of his medical care needs. He must, however — and this is the rub — use *only* PPC Plus physicians and PPC Plus contracted hospitals. This is, therefore, another departure from conventional fee-for-service medical care in "contract" medicine. One must concede, though, that if a patient is willing to put up with limiting his access to all physicians and hospitals, it does not look like a bad plan.

The second — and perhaps even more significant — development is the recent decision by the Department of Defense (DOD) to change the way CHAMPUS is operated. Regional capitation grants will be made to the organization which appears to DOD best suited to run the program in areas usually comprised of several states. All of the large health insurance companies are expressing interest. There is a movement underway to organize an IPA involving several states, and though plans are in their formative stage, SCMA has been active in that possible venture.

These two programs are viewed by many as "pilot" projects, the ultimate goal being to get the government out of the health care business. I believe this to be the likely plan.

The purpose of this President's Page is, first, to inform the reader of these things; and second, to point out once more the importance of our continued support and involvement in our state and national organizations. It is total folly to imagine that physicians, unless organized, can be part of this decision making. I realize that this editorial is being read mostly by SCMA members — hopefully those also being AMA members, but even the most resistant of nonparticipators must surely see the importance of this involvement.

Walt Roberts

— Walter J. Roberts, Jr., M.D., *President*

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INFORMATION FOR AUTHORS

Authors should refer to the detailed instructions in the February issue. Manuscripts and other correspondence should be addressed: The Editor, JOURNAL OF THE SOUTH CAROLINA MEDICAL ASSOCIATION, Post Office Box 11188, Columbia, S. C. 29211.

All manuscripts should be accompanied by a transmittal letter with the following paragraph: "This original work has not been submitted or published elsewhere, in entirety or in part. I (we) hereby transfer, assign, or otherwise convey all copyright ownership to the South Carolina Medical Association in the event that this work is published by the SCMA."

We request that manuscripts be concise (no longer than 8 typewritten pages, double-spaced), with no more than ten references. These should be cited in the text in superscript, e.g., "Bottsford, et al.[3]", and should conform to the following style: "3. Bottsford JE, Bearden RC, Bottsford JG: A ten year community hospital experience with abdominal aorta aneurysms. *J S C Med Assoc* 79: 57-62, 1983." Ordinarily, publication of four small illustrations or tables or the equivalent will be paid for by *The Journal*. Manuscripts should be submitted in duplicate. Reprints will be made available by the publisher.

EPIDEMIOLOGY OF BREAST CANCER*

HENRY PATRICK LEIS, JR., M.D.**
FREDERICK L. GREENE, M.D.
SUSAN E. HILFER, M.D.

"Medicine," said Lord Bryce,[1] "is the only profession that labors incessantly to destroy the reason for its own existence." There is no better example than the physician's continuous search for factors related to the epidemiology of breast cancer, in the hope of reducing its frequency.

The United States is in the upper middle third on the world-wide statistical graph of breast cancer incidence rates. It is the most common cancer in women accounting for 26 percent of all the cancers that develop in them. One out of every 11 women, or about nine percent, will develop it during her lifetime. Every 15 minutes there are three new cases. In 1986, in the United States alone, 123,900 new cases are projected, 123,000 of which will be in women. Of these 1,411 will occur in South Carolina, 1,400 of which will be in women.[2]

There is an ever increasing number of breast cancers. In 1965 there were 68,000 new cases as compared to 119,000 in 1985. This is due chiefly to the fact that there are more women and that they are living longer into the cancer prone years. However, in addition, there is also an increasing incidence rate per 100,000 population. In 1965 the incidence rate was 69 per 100,000 while in 1985 it had risen to 78 per 100,000. This increasing incidence is predominately in women under 55 years of age and in Black women. Possible reasons for this include: earlier diagnosis, especially in a preclinical stage, better statistical reporting, changes in dietary habits and hormonal milieu, increasing exposure to carcinogens and decreasing host immunocompetence.

Breast cancer is due to a constellation of epidemiological factors, rather than a single one, including: (1) genetic predisposition, (2) adverse hormonal milieu, (3) immunological incompetence, (4) exposure to carcinogens, and (5) personal and demographic factors. It is not a chance event that occurs randomly throughout the population. There is a group who have an increased risk for developing it.[3-9]

Beyond the obvious risk factors of a lump in the breast, or of a nipple discharge, the ones of major importance are sex, with over 99 percent occurring in women, followed by age with over 85 percent occurring after the age of 45 and over 67 percent after the age of 50.

As to *genetic* predisposition, female relatives of women with breast cancer have a threefold increased risk of developing it. The risk is related predominately to a family history of breast cancer that is premenopausal and bilateral in close relatives. Thus, a woman with a mother or sister who had premenopausal bilateral breast cancer has a ninefold risk.

There is a twofold increased risk in patients with the genetically controlled wet type of earwax. The increased risk in Caucasians and Blacks, which is steadily decreasing, may be related to personal and demographic factors, especially diet, rather than a genetic predisposition.

Patients with a history of *benign breast disease* have an increased risk with a threefold risk in those who have had a previous biopsy and about a two and one-half fold risk for those with fibrocystic "disease." Those with histologic findings indicative of precancerous mastopathy, i.e., lobular or ductular proliferative hyperplasis with marked atypia or apocrine metaplasia with marked atypia, carry a fivefold risk.

A history of *previous cancer in one breast* carries a fivefold risk for the remaining breast. There is a group who have an especially high risk, including those under 50, in good health, with early, good prognostic types of cancers, those with a close family history of breast cancer, especially if it is premenopausal and bilateral, those whose first breast cancer was multicentric, those with precan-

* From the Breast Cancer Screening and Diagnostic Center of the University of South Carolina School of Medicine, Columbia, South Carolina, and the Institute of Breast Diseases of New York Medical College, Valhalla, New York.
** Address reprint requests to Dr. Leis at 113 11th Avenue North, The Pines, North Myrtle Beach, South Carolina 29582.

cerous mastopathy on the random biopsy of the remaining breast, and those with a DY (dense parenchymal pattern) on mammography or an increased thermal pattern on thermography of the second breast.

Nulliparous women have a threefold risk for developing breast cancer. This seems to be related to the patient's age at first parity and relates to postmenopausal cancers predominately. There is a fourfold decreased risk for developing it with first parity before age 18 which gradually reduces to about age 28. First parity after the mid-thirties carries a fourfold risk, higher than that for nulliparous women.

Patients with *adverse hormonal milieu* include those with prolonged menstrual activity, lowered androgen excretions, and decreased estriol to estradiol and estrone titers. It is postulated that hormones are not carcinogenic but that an adverse hormonal environment influences the susceptibility of the breast to carcinogens. There are two types of hormone dependent cancers. The first occurs in premenopausal women and is related to estradiol and estrone from the ovaries. The second occurs in postmenopausal women and is related to estrone produced by the metabolism of a steroidal precusor elaborated by the adrenals.

Despite all the evidence that estrogens are involved in the epidemiology of breast cancer, it is difficult to obtain any statistically valid evidence to indicate that the widespread use of estrogens for contraceptive purposes and menopausal symptoms, is associated with an increased risk for developing breast cancer. However, there might be sub-groups of patients, who are already at risk, where estrogens might have an adverse effect including premenopausal women with a family history of breast cancer taking oral contraceptives and menopausal women who are nulliparous or late first parous, taking estrogen replacement therapy.

A number of investigators have reported on a link between decreased progesterone and also of hypothyroidism, and an increased risk for developing breast cancer. Prolactin has been implicated in some reports but the data are argumentative.

Patients with an *immunologic deficiency* have an increased risk, including: (1) older patients with thymic atrophy, (2) other patients with decreased thymus dependent lymphocytes, (3) patients on chemotherapy, (4) patients on immunosuppressive drugs and (5) patients exposed to heavy ionizing radiation.

Possible *carcinogens* include a B-type virus similar to the mouse tumor virus, the rauwolfia alkaloid reserpine, excess alcohol consumption, methyl dopa, phenothiazine, dextroamphetamine, some antidepressants, some antihistamines, polycyclic hydrocarbons, methylxanthine, certain hair dyes and ionizing radiation.

Some of these are open to question but *radiation* is a proven carcinogen which also lowers host resistance. Patients at possible increased risk from radiation exposure include: (1) those who had multiple fluoroscopies for tuberculosis therapy, (2) those who had an excess number of high dose diagnostic x-rays, (3) those who had radiation treatments for mastitis, gynecomastia, bleeding nipples and acne over the breasts as well as those with keloids over the breast treated by radiation, (4) those who had primary radiotherapy as a treatment for breast cancer, and (5) those exposed to radiation from atomic bombings. It is important to note that the carcinogenic effect relates to increasing dosage and that it is the young breast, under 35, that is adversely affected. Modern low dose techniques with mammography make any carcinogenic effects remote, if at all.

The personal and demographic factors that have been linked to an increased risk include: obese women, women with wide body types, women with the triad of obesity, hypertension and diabetes, women living in a cold climate and those in the Western Hemisphere, affluent women, Jewish women and those with chronic psychologic stress, especially if they have an abnormal suppression of anger. The incidence rate of breast cancer varies markedly from one country to another and even within various sections of the same country. It is higher in developing countries, in those with a predominant Caucasian population and in countries and areas where there is poverty.

Studies indicate that many of these factors may be environmentally related rather than being racial or genetic. There is an increasing body of evidence to show that the type of diet may be the basis for many of these risk factors. There is less breast cancer in patients who live on a high fiber, low fat diet, with abstinence from methylxanthine and who take certain supplemental vitamins (A, B complex and C) and selenium. The diet is designed to lower the exogenous levels of estrogens, prolactin and cholesterol and to improve host

resistance. As Hippocrates,[10] the father of medicine said, "Let your food be your medicine."

There is an increased risk for women who have had other organ cancers such as the ovary, salivary glands and colon, but especially the endometrium with a threefold increased risk.

There is no documented evidence to indicate that a single trauma increases breast cancer risk but it could aggravate a preexisting precancerous mastopathy or occult cancer causing a more rapid progression.

Although subject to some debate, there is evidence to show that patients with a DY (dense parenchymal pattern) on breast x-rays and those with an abnormal thermal pattern on thermography are at increased risk.

The ultimate search for the woman with the highest risk for developing cancer would culminate in the finding of a 58-year-old, obese, hypertensive, diabetic, hypothyroid, white, nulliparous woman, on reserpine therapy for hypertension and estrogen for severe climacteric symptoms, living in a cold climate in the Western hemisphere, whose mother and sister had bilateral premenopausal breast cancers, who has a wet type of earwax, a low estriol titer and subnormal levels of androgen secretions, who had a previous endometrial cancer, nursed from her mother who had B viral particles in her milk, whose menarche was at age nine, who has had cancer of one breast, whose other breast had a precancerous mastopathy on biopsy, a dense parenchymal pattern on mammogram and an elevated thermal pattern on thermography, who received multiple fluoroscopies for tuberculosis when she was 19, who had severe hepatitis and now has liver dysfunction, who has decreased thymus dependent lymphocytes, who lives on a high fat, high beef, low fish and fiber diet deficient in vitamins, who drinks an excessive amount of coffee and who dyes her hair.

Identification of women at risk for breast cancer is unfortunately much more subtle. □

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CARCINOMA OF THE BREAST: WHEN MAY THE BREAST BE SAVED?

C. D. BESSINGER, JR., M.D.*

There is a particularly compelling question that always comes to the mind of each new breast cancer patient: "Is mastectomy necessary?" Since the report of the prospective study of the National Surgical Adjuvant Breast Project (NSABP),[1] there has been greater acceptance by surgeons, and greater demand by patients, for breast-sparing treatment for early breast cancer.

Decision-making at the time of the initial treatment has thus become considerably more challenging than before, and requires more individualized evaluation of clinical, pathologic, and personal factors. Here, we review the many factors that must be taken into account before answering that primary patient question.

BACKGROUND

Throughout this century, the standard treatment for early carcinoma of the breast has been total removal of the breast and the axillary lymph nodes, and before the acceptance of the "modified radical," the removal of the pectoral muscles as well. There has always been concern about the apparent necessity for such radical surgery when the carcinoma is quite small and has no detectable spread to the axillary lymph nodes.

However, some form of radical mastectomy remained the preferred treatment for two substantial reasons: (1) the prevailing concept held that systemic metastasis generally occurred only after involvement of the regional nodes, and that the en bloc resection theoretically gave the best protection; and (2) the earliest trials of radiation therapy yielded poorer survival results than radical mastectomy.

As radiation equipment permitted higher energy levels, however, better survival results were obtained. Further, the understanding of cancer spread improved. It became clear that systemic spread was independent of regional lymphatic spread, and surgery and radiation came to be seen as measures only for local control. Better protection against systemic involvement required adjuvant chemotherapy or hormonal therapy (in carefully selected patients) rather than more radical surgery.[2]

During the past decade, substantial literature has developed from centers in Europe[3, 4, 5] and the United States[6, 7] which indicated favorable survival results with limited surgery and irradiation. The NSABP study[1] confirmed that there is no statistically significant difference in five-year actuarial survival curves when treatment of early breast cancer by total mastectomy with axillary dissection is compared to segmental mastectomy with axillary dissection and high-dose high-energy radiation of the breast. Segmental mastectomy without follow-up radiation is markedly less effective.

PATIENT SELECTION

There are many factors to be weighed before recommending a particular treatment for a particular breast cancer patient. These include clinical factors which can be evaluated by physical examination and other diagnostic studies, histologic factors which require pathologic evaluation, and personal factors which require careful discussion with the patient.

CLINICAL CONSIDERATIONS

The foremost criterion is tumor size. If the breast is to be saved, the tumor must be relatively small. Although the Marseilles study[3] based its report on a five centimeter maximum, the NSABP report[1] excluded tumors larger than four centimeters in diameter. The tumor must be capable of complete excision without involving other structures. If excision had to destroy the nipple-areolar complex, the cosmetic result would be so bad that mastectomy with reconstruction would be preferable. Likewise, mastectomy is required if there is fixation to deep tissues.

The size of the breast in relation to the tumor is also important. The cosmetic result is poor after

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radiating a small residual breast, and the oversize breast is subject to undue induration and retraction.

Clinically obvious axillary metastases usually constitute indications for mastectomy, but Montague[7] and the NSABP[1] accepted patients for segmental mastectomy and irradiation with low mobile palpable axillary nodes. Of course, any clinical evidence of systemic metastasis places the patient in a palliative rather than curative treatment category.

PATHOLOGIC CONSIDERATIONS

Success in achieving local control of breast cancer requires complete excision of tumor. Therefore, any evidence of multifocal disease, whether by mammography or in the pathologic specimen, is an indication for mastectomy rather than conservative surgery.

Other pathologic features that require mastectomy include prominent intraductal carcinoma in the tumor or intraductal carcinoma in the grossly normal adjacent tissue, and poorly-differentiated tumor.[8]

The status of the axillary lymph nodes is one of the most important prognostic factors, and is the determinant for the use of adjuvant chemotherapy. Therefore, axillary dissection is done after lumpectomy and before irradiation if breast conservation treatment is used. Levitt has reported that the cosmetic result of the conservative surgery and radiation technique is reduced when adjuvant chemotherapy is used.[9]

PERSONAL CONSIDERATIONS

Even if the clinico-pathologic factors are favorable, mastectomy may still be the preferred treatment for a particular patient. The radiation treatment requires special skill to achieve good survival and cosmetic results, and requires five or six weeks of treatment. Therefore, success in treatment requires that the patient live reasonably close to a qualified treatment center.

All patients with breast carcinoma should be followed closely for local and systematic recurrence. However, this seems particularly important for the breast conservation group, since early detection of local recurrence can often permit good survival prospects if salvage mastectomy is done.[3] Thus, patient reliability and follow-up should also be considered during pre-treatment evaluation.

Psychological factors are quite important. The breast conservation patient should be highly motivated to complete the required treatment regimen, and should be free of an inordinate fear of recurrent cancer in the treated breast.

Family factors such as the ability to make arrangements for child care, etc. may enter into the patient's decision. It is usually appropriate for the husband or other responsible family members to participate in the discussions about the patient's disease. Generally speaking, the whole family should understand the issues involved, and be able to help support each other in coping with the recommended treatment program.

Age generally is not a factor. Breast conservation may often be the appropriate alternative in patients of advanced age or who are poor operative risks for major surgery.

DISCUSSION

If it is immediately clear that the patient is a candidate for mastectomy rather than breast conservation therapy, and the patient is ready to accept that alternative pre-operatively, the biopsy and definitive surgery can be accomplished at the same anesthesia (the "one-step" procedure). For most patients, however, evaluating the alternatives must take into account the pathologic factors mentioned above. For those patients, the "two-step" procedure is more appropriate. The patient has the biopsy for diagnosis, followed by full discussion of alternatives, and radiotherapy consultation if appropriate, before definitive treatment.

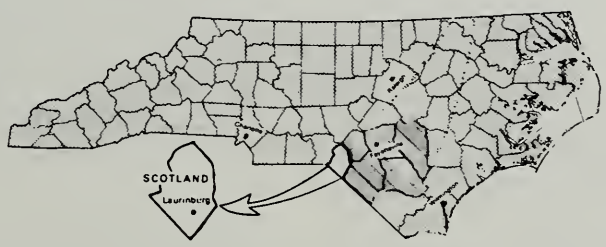
It is helpful, therefore, if the pre-biopsy breast evaluation (including any needle aspiration techniques) is done by a surgeon who is skilled in dealing with breast cancer, and who is prepared to consider alternatives and deal sympathetically and individually with each patient to answer the many questions involved.

There are of course many current issues in breast cancer treatment. Here, we have limited ourselves to commenting only on pre-treatment decision making. Obviously, the large number of factors to be considered means that there is no easy or automatic answer to the selection of treatment for early breast carcinoma. Each patient's therapy must be individualized to that patient, after all necessary information is available. When that is appropriately done, the patient is much

more able to cope with the disease, to undergo treatment successfully, and to resume a full and optimistic normal life. □

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BRAIN TUMORS IN CHILDREN: AN OVERVIEW

WILLIAM F. SCHMIDT, M.D., Ph.D.*

Brain tumors are the second most common form of childhood cancer. The annual incidence of brain tumors in children under 15 years of age is 2.39 per 100,000, to yield nationally 1,200-1,500 new cases per year.[1] In South Carolina, this translates into approximately 23 new cases each year.

Despite rapid advances in the treatment of other childhood tumors, progress in the treatment of brain tumors has been slow, and there has been little change in patient management over the past decade. Many factors can be cited to account for the poor results. The first is that while often regarded as one disease entity, the various brain tumors are composed of unique cell types with unique behaviors, albeit originating from the same organ. For example, an astrocytoma is as different in its natural history and biology from a medulloblastoma as a squamous cell carcinoma is different from a melanoma. Brain tumor subtypes do not always receive specific treatment.

A second factor is that single institutions rarely accumulate enough brain tumor cases to adequately assess the efficacy of treatment regimens for each subtype. The relative frequencies of the pathologic subtypes of brain tumors are outlined in Table I. Astrocytomas comprise the single largest group by far, and there are only approximately 600 childhood cases per year nationwide. Medulloblastoma, a more malignant solid tumor in children, accounts for less than 150 new cases per year nationwide. Moreover, since only about 50 percent of children with brain tumors are ever referred to university or treatment centers, accumulation of accurate data on the histologic subtypes has been slow.[4]

Other factors may also help to explain the poor results obtained thus far in treating pediatric brain tumors. The location and infiltrative nature of many tumors hinder surgical debulking of the primary lesion. Toxicity associated with high doses of cranial-spinal irradiation prevents the use of maximally effective radiation doses. Low metabolic and mitotic rates make many brain tumors unresponsive to both radiation therapy and chemotherapy. Certain tumors develop rapid biologic resistance to therapy. The normal blood-brain-barrier limits access of many chemotherapeutic agents to tumor cells. Finally, there is no universally accepted histologic nomenclature; histologies may be interpreted differently at different treatment centers, making the choice of type-specific treatment difficult.

TABLE I

INCIDENCE OF CHILDHOOD TUMOR HISTOLOGIC SUBTYPES IN TWO RECENT LARGE SERIES (WITH PROJECTED INCIDENCE IN SOUTH CAROLINA)

	Yates, et. al 1979 [2] (N=689)	*Ertel 1980 [3] (N=425)*	*Projected yearly cases for South Carolina°*
Astrocytomas	*45.9%*	*45.2%*	*10*
Medulloblastomas	*16.3*	*10.6*	*3*
Ependymomas	*12.8*	*13.7*	*3*
Craniopharyngiomas	*6.0*	*9.8*	*2*
Gangliogliomas	*1.6*	*1.4*	*<1*
Pineal Area Tumors	*1.3*	*1.6*	*<1*
Teratomas	*1.3*	*1.0*	*<1*
Oligodendrogliomas	*0.7*	*0.0*	*<1*
Others	*16.4*	*16.7*	*3*

° *Projected estimates for South Carolina are computed on the 1980 Census figure of 941,966 children in the state under 17 years of age.*

SIGNS AND SYMPTOMS

The signs and symptoms exhibited by children with brain tumors vary with the age of the child and the location of the tumor. Most children with brain tumor experience general signs and symptoms of increased intracranial pressure generated by a slowly enlarging mass in the rigid intracranial vault or by an increasing volume of cerebral spinal fluid secondary to obstruction. These signs and symptoms include irritability, lethargy, decreased appetite, and morning headache accompanied by vomiting. Headache and vomiting may subside temporarily in the young child as the cranial sutures split, to return as intracranial pressure inexorably increases. Diplopia, caused by increased pressure on the long sixth cranial nerve,

° Children's Hospital Center for Cancer and Blood Disorders and the Children's Cancer Research Laboratory, Division of Hematology-Oncology, Department of Pediatrics, U. S. C. School of Medicine, Columbia, S. C. 29208.

is another common symptom of increased intracranial pressure. Children watching television will compensate for diplopia with a head tilt.

More specific signs and symptoms depend on the location of the tumor and its relationship to the neuraxis with which it interferes. Cerebellar tumors often present with ataxia and clear signs of increased intracranial pressure. Brain stem tumors are slow to cause increased intracranial pressure because of their position below the ventricles. These tumors present with cerebellar and long tract signs. Cerebral hemispheric tumors present with deficits that exhibit sidedness such as seizures, hemiparesis and hemisensory loss; intellectual difficulties and school problems may also be seen. Midline tumors present with visual loss and endocrinopathies due to involvement of the optic chiasma and pituitary gland.

PROGNOSIS

The prognosis of children with brain tumors depends again on the nature and location of the tumor, the degree of disseminated disease at diagnosis and often, the age of the child. For astrocytoma, the prognosis worsens as the degree of anaplasia increases and as total excision of the tumor becomes less possible. A low grade cerebral astrocytoma is associated with a 70 percent five-year survival rate. If total surgical excision is possible, the five-year survival rate approaches 90 percent. A biopsy-proven low grade astrocytoma located in the brainstem is associated with only a 30 percent five-year survival rate.[5] Patients with high grade brainstem astrocytomas rarely survive two years.[5] In the case of medulloblastoma, the presence of histologic differentiation toward glial, ependymal, or neuronal lines, metastatic disease, and age less than four years all signal a relatively unfavorable prognosis when radiation therapy alone is used for treatment.[6, 7]

DIAGNOSTIC STUDIES

The major diagnostic tool for identifying brain tumors is now computed tomography (CT), which has virtually replaced pneumoencephalography, ventriculography, radionuclide brain scanning and arteriography. CT scanning with and without contrast is reported to be 96 percent accurate in screening for brain tumors.[8] Ancillary studies include myelography for children with medulloblastomas and ependymomas and examination of the CSF for cytology. Electroencephalograms are abnormal in both infratentorial and supratentorial tumors but are not helpful in localizing intracranial tumors.[9] Magnetic resonance imaging (MRI) is the newest diagnostic tool for imaging brain tumors, and is now available to patients at the Children's Hospital Center for Cancer and Blood Disorders. MRI uses high energy radio waves instead of ionizing radiation as its energy source, and is especially useful in the region of the posterior fossa where overlying bone may obscure pathology on the CT scan.

THERAPY

Surgery remains the mainstay of brain tumor therapy although surgical cures are rare. Complete surgical excision of most tumors is prevented by the infiltrative nature of the tumors and by the necessity of preserving adjacent vital structures. This infiltrative characteristic of many brain tumors can be appreciated by viewing the amorphous outgrowths of individual cells in tissue culture, as shown by Figure 1. Stereotactic technology permits sampling of neoplastic tissue formerly inaccessible, so that more tumor-specific therapy is now possible.[10] The addition of the newer techniques of laser surgery to stereotactic localization may allow more precise excision and effective debulking of some tumors in the future.

Radiation therapy is the second major therapy for brain rumors. Unfortunately, the tolerance of normal brain tissue for irradiation is often less than the tolerance exhibited by the tumor. Untoward effects of radiation therapy are often quite serious in younger children and include severe intellectual and developmental impairment as well as endocrine abnormalities.[11] New techniques designed to enhance cell kill at lower radiation doses are currently being evaluated. These include radiosensitization and hyperthermia. Hyperfractionation is a new radiation technique in which two to three treatments of 80-100 rads are given daily instead of the typical single 180 rad dose. Preliminary studies suggest that higher cumulative doses can be given in this manner with less damage to normal tissue.[12]

Chemotherapy has lagged significantly behind surgery and radiation as a treatment modality for brain tumors. Of the three modalities, however, chemotherapy has perhaps the best potential for curing disease. Chemotherapy has been most successful in the treatment of medulloblastoma, which might be expected as this tumor has one of

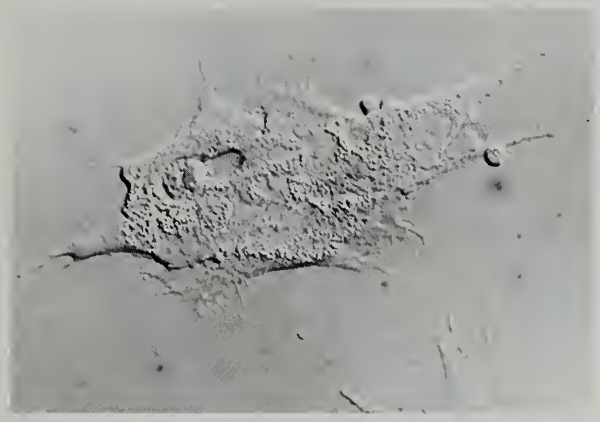


FIGURE 1. Pinealblastoma cells from tissue culture. Nomarski optics, 400X.

the highest mitotic indices of all of the brain tumors. The addition of chemotherapy to surgery and radiation therapy in one large trial doubled the five-year survival rate for this tumor to 60 percent.[13] The efficacy of chemotherapy is still limited, however, by several obstacles to the delivery of chemotherapeutic agents to the tumor. The first is the blood brain barrier which prevents large, polar molecules from reaching the CSF. A few lipid soluble drugs like the nitrosoureas do cross easily into the CSF and exhibit steep dose response curves when tested against glial cells in culture and animal models.[14] These drugs are disappointing, however, when used after radiation therapy in clinical trials,[15] possibly because a major source of bone morrow reserve has been destroyed by the irradiation, thereby necessitating lower chemotherapy doses. Trials are now in progress evaluating the efficacy of administering chemotherapy before radiation. Evidence is beginning to accumulate that suggests the blood brain barrier may already be disrupted by tissue necrosis in the core of the tumor. Whether the barrier is intact at the tumor's leading edge where most of the viable tumor cells are located is still in question. Another impediment to the effectiveness of drug therapy is the tendency of some tumors, such as gliomas, to develop resistance to the chemotherapeutic agent.[16] Drugs which are initially effective in treating the brain tumor may rapidly become useless, for reasons which are as yet unclear.

CHILDREN'S HOSPITAL CENTER FOR CANCER & BLOOD DISORDERS

The Children's Hospital Center for Cancer and Blood Disorders is affiliated with the Children's Cancer Study Group (CCSG). CCSG is a national organization, composed of a large number of childhood cancer research and treatment facilities, which designs treatment protocols based on shared data and experience. This relationship allows us to participate in the accumulation of the most accurate data on the various treatment regimens, and to benefit from the experience of other centers through the use of protocols which are not available to non-affiliates.

Successful treatment and rehabilitation of the child with brain tumor require more than proper diagnosis and good protocols. Brain tumors and their subsequent treatment can result not only in the disruption of many body systems such as movement, intelligence, speech, sensation, and hormonal balance, but also in the disruption of family life and social interactions. The care required by afflicted children is complex and beyond the expertise of a single specialist. For this reason, the Pediatric Neuro-Oncology Service was established recently at our Center. Its purpose is to coordinate at a single location the multifaceted treatment plan necessary for children with brain tumors. Physicians on the Service include representatives from the fields of pediatric oncology, neurosurgery, pediatric neurology, radiation oncology, developmental pediatrics, and diagnostic radiology. Specialists from the fields of nursing, psychology, speech and language, audiology, physical therapy, and social work are also present. This coordinated management approach facilitates early diagnosis and treatment of intellectual, emotional, and physical disabilities and provides psychological support for the patient's entire family.

THE CHILDREN'S CANCER RESEARCH LABORATORY

The Children's Cancer Research Laboratory (CCRL) at our Center was established to conduct basic research into the causes and cures of childhood cancers. A major portion of this research is directed toward the biology of childhood brain tumors. One line of investigation attempts to characterize tumor cell subtypes from lesions in individual patients cared for at our Center. Samples of brain tumor biopsy specimens are obtained at diagnosis with informed consent and are used to establish tissue culture cell lines both *in vitro* and *in vivo* using athymic nude mice as hosts. Cell growth characteristics are determined, then cells

are categorized according to their reactions with specific neuronal monoclonal antibody stains. The goal of this investigation is the accurate prediction of cell behavior for each tumor subtype.

The CCRL is also investigating the role of calcium metabolism in tumor cells. Some drugs which interfere with calcium metabolism appear to enhance the antineoplastic effect of common therapeutic agents. For example, we have observed that certain cell lines are more susceptible to the antineoplastic effects of vincristine and methotrexate when cells are pretreated with verapamil, a new calcium channel blocking agent. Preliminary results suggest that verapamil exerts its effect by permitting increased amounts of antineoplastic agent to accumulate in the cell. These studies are still in their infancy but may eventually provide ways to deliver more drug to brain tumor cells *in vivo*.

FUTURE DIRECTIONS

If the next decade is to see more progress than the last in the treatment of childhood brain tumors, a concerted and cooperative effort on all fronts is essential. To improve the outlook for children with brain tumors, we must continue to develop separate treatment strategies for each specific tumor through wider enrollment of patients on cooperative protocols such as those developed by the CCSG. Efforts should also be directed toward the establishment of a state-wide tumor registry to facilitate the collection and sharing of information on childhood cancer. Further research into the biology of tumor subtypes is imperative. As part of our cooperative effort, the Children's Cancer Research Laboratory will make brain tumor cell lines available to the scientific community for basic research. □

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SCMA NEWSLETTER

September, 1986

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WORKERS COMPENSATION CLAIMS

The SCMA Occupational Medicine Committee, in cooperation with the South Carolina Workers Compensation Commission, will be notifying all physicians in the state regarding a problem being experienced with physicians' billings for Workers Compensation Claims.

The Commission fee schedule which provides physicians and their office staff with information necessary to file claims and receive timely payments is not being utilized in all billing instances, resulting in a significant number of claims exceeding the published fee and causing unnecessary delays in payment.

If you do not have a fee schedule, you may obtain one from Mr. Bill Rodgers, Director, Medical Services, South Carolina Workers Compensation Commission in Columbia, 737-5741.

The SCMA Committee and the Commission ask your cooperation in adhering to the fee schedule except in cases where you feel a higher charge can be readily justified. In such cases, please submit a report explaining the reasons you feel substantiate the higher charge.

STATE PHYSICIAN NETWORKS

SCMA staff recently attended a meeting in Atlanta along with representatives of 25 other state medical associations to discuss the possible need for a network of physicians to respond to proposals such as the recent CHAMPUS Request for Proposal. It has been reported that HCA, Equitable Insurance Company and Blue Cross and Blue Shield of South Carolina have banded together to bid for the CHAMPUS contract. The SCMA Board of Trustees has endorsed a Georgia Medical Association Resolution which calls for a membership organization to inquire into and respond to the proposal by the Department of Defense to restructure the CHAMPUS program, as well as other issues of common interest. The SCMA Board of Trustees has also instructed staff to continue to monitor developments in this area.

AMA YOUNG PHYSICIANS SECTION

As reported earlier, the AMA House of Delegates at its Annual Meeting in June, voted to establish a Young Physicians Section, and encouraged all state associations to consider development of a Young Physicians Section, consisting of physicians under 40 years of age or in their first five years of practice. The SCMA Board of Trustees has endorsed

this concept and has asked the Committee on Constitution and Bylaws to develop the appropriate language to present to the SCMA House of Delegates next April. Meantime, the Board of Trustees is considering nominees to represent the SCMA at the initial meeting of the AMA Young Physicians Section during the AMA Interim Meeting in December. Such representatives will be of valuable assistance in establishing the SCMA section. Several young physicians in the state have expressed an interest in becoming actively involved in this process, and the Board of Trustees will announce SCMA representatives next month.

SPECIALTY SOCIETY/AMA P. L. I. PROJECT

National specialty societies have contributed or pledged nearly $500,000 for a joint project with the AMA directed toward bringing about a long-term solution to the out-of-control professional liability problem. Created last year out of a common interest in working together and sharing resources in new activities that will build an extensively-documented case for reforming the liability system and investigating alternatives to traditional tort reform, this coordinated project will complement ongoing AMA/Federation efforts to achieve needed reform.

In its quest for long-term solutions, the coordination project is focusing upon four primary activities: an in-depth study of alternative delivery systems; collection and publication of reliable data documenting the scope of the problem; risk management analysis and coordination; and development of a uniform communications strategy.

The most important facet of coordination project activities will be to thoroughly explore alternatives to the present tort system and to stimulate the implementation of a demonstration project where viable alternatives can be tested.

An 11-member steering committee is comprised of the AMA, the AAFP, the American Academy of Orthopedic Surgeons, the American College of Cardiology, the American College of OB/GYN, the American College of Physicians, the American College of Radiology, the American College of Surgeons, the American Society of Internal Medicine, the Council of National Specialty Societies and the Society of Thoracic Surgeons.

CANCELLATION OF SCMCF MEDICAID AND PRIVATE REVIEW

Effective October 1, the S. C. Medical Care Foundation, a subsidiary of the SCMA, will no longer perform preadmission or inpatient review for Medicaid and private companies. Hence, it is <u>not</u> necessary to call the Foundation to obtain preadmission certification for patients scheduled for surgery after September 30. The S. C. PRO, the Metrolina Foundation of Charlotte, will perform Medicaid review.

CONGRESS MOVES TO END MEDICARE FREEZE

Initial steps to end the prolonged Medicare fee freeze were successful in late July when the influential House Ways and Means Committee adopted a supportive amendment offered by Representative Jake Pickle of Texas. The vote, 18-16 in favor of passage, climaxed a day of intense activity by AMA lobbyists, medical societies executives and key physician legislative contacts from South Carolina and other states.

The Pickle Amendment would end the freeze, established in 1984 and extended three times, on what Medicare pays for physician services. Every physician who sees Medicare patients would receive a 1987 update in their prevailing charge profiles based on the increase in the Medicare Economic Index. The Congressional Budget Office estimates that this will be 3.2 percent.

In this plan, participating physicians would receive an additional 1 percent bonus. This, however, would not be built in the charge profiles of participating physicians and, thus, will have no bearing on their future payments. "Non-participating" physicians would be allowed to increase their actual charges, but any increase would be limited to the MEI increase, plus 1 percent.

In other legislative activity, the House Energy and Commerce Committee approved a provision that essentially permits a 3.2 percent fee and charge increase on assigned claims and a 1 percent fee and charge increase on unassigned claims.

On the other side of the legislature, the Senate Finance Committee has recommended a 1.8% MEI increase for participating and non-participating physicians, but does not include limits on actual charges. The plan would spread the effect of the Administration's proposal to re-calculate the MEI over two years instead of one. It would also retain the participating physician program and, like the Energy and Commerce plan, would set additional limitations on the use of "inherently reasonable" proposal.

OTHER MEDICARE NEWS

In an open letter to the leadership of organized medicine, the AMA Board of Trustees has appealed for all physicians to continue to accept Medicare assignment wherever warranted by financial circumstances of their patients. The SCMA passed a Resolution at the 1986 Annual Meeting to the same effect. The board has also asked medical societies to demonstrate the profession's concern for the economically deprived by either developing or spurring the development of local programs that enable low-income Medicare beneficiaries to receive all their care on an assignment basis.

HOSPITALS TO BE REIMBURSED LESS UNDER NEW PROPOSAL

New DRG-related regulations proposed by the Reagan Administration could mean many hospitals will be paid less next year than in 1986. The proposed rules governing Medicare's DRG pricing system, now in its fourth year, would hold hospital rate increases to 0.5 percent. When other congressionally-ordered changes are added in, rates for most facilities will fall.

The Prospective Payment Assessment Commission (Pro-PAC) advises on the DRG system, and it had recommended a 2.8 percent increase in hospital rates for 1987. Since the President's original budget proposals as well as budget plans approved by the House and Senate assumed a 2 percent increase, the lower 0.5 percent was a shock for hospital officials.

Accompanying the rate increase, which would be effective October 1, is a four-year plan to phase hospital capital costs into the DRG system, which would end the current system that allows hospitals to recoup the full cost of capital investments. This is the first year that Medicare officials are claiming they could justify price cuts rather than freezes or near-freezes. It is also the third year that Medicare recommendations were significantly lower than that of ProPAC.

HOSPITAL ASSOCIATION SEMINAR

The S. C. Hospital Association is sponsoring a series of seminars in conjunction with the S. C. JUA/IRF Loss Control Program. Entitled "Credentialing - Dilemmas and Responses," the program's objectives include an update for physicians on various legal issues arising from the credentials review and approval process. Dates and locations are September 22, at the Charleston Marriott; September 23 at the Heritage Restaurant in Florence; September 24 at the Columbia Marriott; and September 25 at the Greenville Ramada Hotel. Registration fee is $20 per person. Contact Ms. Doris Clevenger, SCHA, PO Box 6009, West Columbia, SC 29171.

AMA PUBLICATIONS DISCOUNT

The AMA is now offering two brochures at a 25 percent package discount, in an effort to encourage physicians to make wider distribution among patients of these publications which advise how to get the most out of health care expenditures.

"What You Can Do About Health Care Costs" (OP-397) and "Let's Talk About Health Insurance (OP-342) may be obtained in combined sets of 10 for $15. Orders should be directed to Book and Pamphlet Fulfillment, AMA, PO Box 10946, Chicago, IL 60610. Credit card orders may be directed to the tollfree number, 1-800-621-8335.



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OUTPATIENT CONTINUOUS INFUSION OF CHEMOTHERAPY: A NEW DIRECTION IN ONCOLOGY

WILLIAM M. BUTLER, M.D., F.A.C.P.*
LELAND J. McELVEEN, M.D.
PHILLIP E. BALDWIN, M.D.

INTRODUCTION

Traditional chemotherapy protocols evolved from a necessity to develop programs that would be acceptable to the schedules of both patients and physicians. This led us to the familiar treatment schedules used today which call for administration of chemotherapy once every three weeks or twice each month. These programs have been tested and refined until we now have many programs which are effective in treating some cancers. Unfortunately, many of the more common cancers do not respond to traditional chemotherapy regimens. Intermittent administration of chemotherapy is also known to produce some undesirable toxicities which may be formidable.

Continuous infusion of chemotherapeutic agents has been used for many years but cost of inpatient care and inconvenience to patients have limited acceptance of this modality of therapy. Theoretically, prolonged infusion of chemotherapy has several advantages over traditional intermittent therapy. The first of these advantages would be to provide active concentrations of drugs for much longer times than with traditional therapy. It has been shown that the half life of most chemotherapeutic agents is quite short, usually minutes to hours. Cell kinetic studies have shown us that the doubling times for most cancers are in the range of 60-90 days. Thus, when used with traditional schedules, only a small fraction of the cancer cells are exposed to active concentrations of drugs during mitotic activity. Prolonged infusion of drugs can maintain active drug concentrations for four to six weeks or longer, thereby providing more opportunity for tumoricidal activity. Secondly, prolonged infusions of chemotherapeutic agents could lessen adverse toxicity of the drugs by decreasing peak drug levels.

Despite the theoretical benefits, it has taken an advance in technology to give prolonged infusions a place in cancer therapy. With the advent of small, portable, computer controlled pumps, prolonged outpatient treatment became feasible. This paper will review our initial experience with this new technique.

PATIENTS AND METHODS

We have treated 30 patients with continuous outpatient infusions of chemotherapy. Five of these patients received no more than seven days of continuous therapy. Twenty-five received prolonged infusions which ranged from three to twelve weeks' duration. We have used several drug regimens and schedules. Vincristine, doxorubicin, vinblastine, cis-platinum, and 5-fluorouracil were the drugs used in this study. Patients with cancer of the colon (6), lung (4), pancreas (1), gallbladder (1), and ampulla of vater (2) have been treated with prolonged infusions without prior trials of standard chemotherapy. Other patients who had not responded to standard chemotherapy regimens and who had progressive cancers of the breast (2), colon (6), prostate (1), thyroid (1), pancreas (1), and esophagus (1), were also treated. Three patients with refractory myeloma were changed from an inpatient infusional regimen to an outpatient regimen. One patient with a recurrent soft tissue sarcoma was treated with several regimens.

The daily dosages of infusional therapy were as follows: 5-fluorouracil was given at 250-350 mg/M^2; cis-platinum at 5 mg/M^2; doxorubicin at 2.5-3 mg/M^2; and vinblastine at 0.75 mg/M^2. Vincristine was used in short term infusions at 0.3-0.4 mg/day for four days. All patients who were placed on continuous outpatient infusion had a subcutaneous chemotherapy access port (Porta-Cath) placed to insure stable venous access during therapy.

* One Medical Park, Suite 410, Columbia, S. C. 29203.

TOXICITY OF INFUSIONAL THERAPY

We have completed 1,362 patient days of continuous outpatient infusion. Toxicity from therapy has been minimal with only one patient requiring a temporary cessation of therapy. In contrast to traditional regimens, there was very little hematological toxicity. Only five patients had leukocyte counts less than 3000/mm3 and four of these had been previously treated with traditional chemotherapy regimens. No therapy was discontinued because of hematological toxicity in this study group. Mucositis was seen in five patients and in one patient it was severe enough to require cessation of therapy. Some loss of appetite was described by ten patients, nausea was reported by five patients, and vomiting was reported by two patients. No patient required more than oral antiemetics to control nausea. The hand-foot syndrome, which consists of painful swelling of hands and feet, was seen in one patient. No infections occurred during or in association with the prolonged outpatient infusions. One patient developed marked darkening of the palms during prolonged infusion of 5-fluorouracil.

TUMOR RESPONSES

While the primary purpose of this study was to assess the feasibility, safety, and toxicity of outpatient infusional therapy, we have also looked at tumor response in those patients with measurable disease. All of our patients with multiple myeloma had objective responses to therapy. Responses in patients with solid tumors and no prior chemotherapy are shown in Table I. Objective responses were seen in metastatic cancers of the colon, ampulla of vater, and lung (non small cell). Six other patients with stage C colon cancer were treated adjuvantly with prolonged infusions and have had no recurrence, but follow up in these patients is limited.

Table I
RESPONSES TO CONTINUOUS INFUSION
IN PATIENTS WITHOUT PRIOR CHEMOTHERAPY

Tumor	*Number Treated*	*Number Responding*
Colon	6	3
Gall Bladder	1	0
Ampulla	2	2
Pancreas	1	0
Lung	4	2

CONCLUSIONS

Prolonged outpatient infusion of chemotherapeutic drugs is a practical alternative for treatment of patients with cancers that are known to be unresponsive to standard chemotherapy. The toxicity of this new therapy is significantly less than with traditional chemotherapy and patient acceptance of infusions has been good. Our data and that of others[1, 2] support further investigation of this modality. The responses seen in cancers arising in the gastrointestinal tract[3] are encouraging. Hopefully, other cancers will respond similarly when the proper drug dosage and duration of therapy are found. □

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3. Benedetto P, et al. Chronic Continuous Infusion of 5-FU in Previously Untreated Patients with Measurable Metastatic Colorectal Cancer. Proceedings of the American Society of Clinical Oncology 1986; 5:92

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Continuing Medical Education

Fourth Quarter
1986
Calendar

O'Neill Barrett, M.D., Chairman

Published by the S.C.M.A. Committee on Continuing Medical Education
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OCTOBER

FRIDAY- SATURDAY **OCTOBER 3-4**
CLEMSON, Clemson Ramada Inn
"CME Sym-Paws-Ium '86"
SPONSOR: Alumni Association of Clemson and MUSC
DESCRIPTION: To expose attendees to important current topics in general medicine.
AUDIENCE: Primary Care Physicians
CONTACT: Newton Brackett, M.D., (803) 792-4123
CME CREDIT: 8 Hours AAFP Prescribed

FRIDAY-SATURDAY **OCTOBER 24-25**
HILTON HEAD ISLAND, Sea Pine Plantation
"Coronary Heart Disease and Arrhythmias: Diagnosis and Management"
SPONSOR: Medical Education Resources, Littleton, CO 80120
DESCRIPTION: Clinical Diagnosis and Management of Coronary Heart Diseases and Arrythmias.
AUDIENCE: Primary Care Physicians
CONTACT: Stephen E. Mattingly, (303) 798-9682
CME CREDIT: 11 Hours AAFP Prescribed

FRIDAY **OCTOBER 24**
COLUMBIA, USC Medical School Lecture Hall
"Founder's Day — Medical Problems 1986"
SPONSOR: University of South Carolina School of Medicine
DESCRIPTION: The Founders Day seminar is presented in honor of the Alumni of the USC School of Medicine. Lectures will be given on various medical topics by distinguished speakers.
AUDIENCE: Primary Care Physicians
FACULTY: Richard M. Krause, M.D., Emory University
Paul G. McDonough, M.D., Medical College of Georgia
Ronald Chance, Ph.D., Eli Lilly Labs
FEE: No fee for faculty/alumni/students (USC SM)
$25 for friends of the University
CONTACT: Kay F. McFarland, M.D., (803) 733-3331
CME CREDIT: 4 Hours AAFP Prescribed

FRIDAY-SUNDAY **OCTOBER 24-26**
HILTON HEAD, Marriott Hilton Head Resort
"South Carolina Society of Pathologists Annual Meeting"
SPONSOR: South Carolina Society of Pathologists
DESCRIPTION: The guest speaker will be Henry D. Appelman, M.D., Professor of Pathology, at the University of Michigan Hospitals. Dr. Appelman's presentation will be "Inflammatory Bowel Disease."
AUDIENCE: Pathologists
CONTACT: Debbie Shealy, (803) 798-6207
CME CREDIT: Applied For

FRIDAY-SATURDAY **OCTOBER 31 - NOVEMBER 1**
CLEMSON, Ramada Inn
"Second Annual Scientific Session of the Academy of Surgical Research"
SPONSOR: Clemson University, MUSC, USC School of Medicine, University of GA, Under the auspices of Bioengineering Alliance of SC
DESCRIPTION: This program will encourage, promote and advance professional and academic standards, education, research and in the arts and sciences of experimental surgery. To promote humane use and treatment of experimental animals. To encourage the advancement of the field of surgery in all of its aspects.
AUDIENCE: MD, DVM, DDS, PhD
CONTACT: Dr. Von Recum or Dr. D.L. Powers (803) 656-5561
FEE: $100 Members, $135 Non-Members
FACULTY: Distinguished national and international speakers
CME CREDIT: 9 Hours AMA Category I

NOVEMBER

THURSDAY **NOVEMBER 6**
COLUMBIA, Crafts Farrow State Hospital
"Genetric Medicine: Today's Growing Practice"
SPONSOR: Crafts Farrow State Hospital, Department of Mental Health
AUDIENCE: MDs
CONTACT: Betty Guerry, M.D., (803) 737-7600
Spencer Ackerman, (803) 737-7721
FEE: $7.00
CME CREDIT: 4.5 Hours AMA Category I - Applied For
4.5 Hours AAFP Prescribed - Applied For

SATURDAY **NOVEMBER 8**
ORANGEBURG, Holiday Inn
"State Meeting of the Epilepsy Association of South Carolina"
SPONSOR: Epilepsy Association of South Carolina
AUDIENCE: MDs, RNs, Other Interested Parties
CONTACT: Janie Goodwin, (803) 799-8341
FEE: $15.00
CME CREDIT: Applied For

FRIDAY-SUNDAY **NOVEMBER 21-23**
CHARLESTON, Omni Hotel at Charleston Place
"Care of the Critically Ill or Injured"
SPONSOR: Division of Respiratory/Critical Care MUSC
DESCRIPTION: Rapid recognition of and practical management of each condition listed.
AUDIENCE: Primary Care Physicians
CONTACT: H. David Reines, M.D., (803) 792-2346
CME CREDIT: 18 Hours AAFP Prescribed

DECEMBER

WEDNESDAY-SATURDAY **DECEMBER 3-6**
HILTON HEAD ISLAND, Hyatt Regency
"SCAFP 38th Annual Scientific Assembly"
SPONSOR: SCAFP
DESCRIPTION: To update family physicians on current medical trends
AUDIENCE: Family Physicians
FEE: Registration members $175.00
CONTACT: W. McGill Woodward, M.D., (803) 556-1762
CME CREDIT: 25 Hours AAFP Prescribed

WEDNESDAY DECEMBER 10
COLUMBIA, Farley Conference Room, Room 3A110, Dorn Veterans' Hospital
"Diabetes Seminar"
SPONSOR: USC School of Medicine and Dorn VA Hospital
DESCRIPTION: All day seminar on Diabetes Mellitus-Changing Dietary Therapy
AUDIENCE: MDs, RNs, and Other Health Care Professionals
CONTACT: J. Robert Hewson, M.D., (803) 776-4000-Ext. 222
FACULTY: Steven Leichter, M.D., Kentucky Diabetes Foundation
CME CREDIT: Hour for Hour Credit

GRAND ROUNDS
U.S.C. School of Medicine

2nd and 4th WEDNESDAYS 3:00-4:00
GASTROINTESTINAL RADIOLOGY CONFERENCE
COLUMBIA, VA Radiology Dept. Conference IC 209, VA Hospital
SPONSOR: USC School of Medicine, Dept. of Radiology and Gastroenterology and Division of Internal Medicine
DESCRIPTION: One-half of the conference will be a discussion and film review of a specific subject. The second half will be devoted to current case material with both radiographic and endoscopic findings.
AUDIENCE: Radiologists, Gastroenterologist and other interested physicians
CONTACT: James J. Farrell, M.D., (803) 733-3295
FACULTY: USC School of Medicine, Dept. of Radiology; Division of Gastroenterology, Internal Medicine and Guest Speakers
CME CREDIT: 1 Hour AMA Category I per session

MONDAYS 7:00 A.M.
ORTHOPAEDIC GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital - 1st Floor
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

MONDAYS 4:00 P.M.
BASIC SCIENCES SEMINAR SERIES
CONTACT: Louis Terracio, Ph.D., (803) 733-3373

MONDAYS-THURSDAYS 12:00-1:00 P.M.
INTERNAL MEDICINE LECTURE SERIES
Richland Memorial Hospital 7 West Classroom
CONTACT: J. O'Neal Humphries, M.D., (803) 765-6563

2st & 3rd MONDAY 12:30 P.M.
G.I. JOURNAL CLUB
Dorn Veterans' Hospital Room 5A127
CONTACT: John Orchard, M.D., (803) 776-4000 Ext. 673

MONDAYS, TUESDAYS, WEDNESDAYS, & THURSDAYS
12:00-1:00 P.M.
FAMILY PRACTICE CONFERENCE
COLUMBIA, Richland Memorial Hospital, Large Dining Room of the Cafeteria—Mondays—Family Practice Conference Room—Tuesdays and Thursdays
SPONSOR: Dept. of Family Practice, USC School of Medicine
AUDIENCE: Family Practice and Internal Medicine Physicians and Medical Students
CONTACT: Roslyn D. Taylor, M.D., (803) 765-6118, Dept. of Family Medicine Richland Memorial Hospital, Columbia, SC
FACULTY: Dept. of Family Medicine and Internal Medicine, USC School of Medicine
CME CREDIT: 1 Hour AMA Category I per session

TUESDAYS 7:00 A.M.
BASIC SCIENCE & PATHOLOGY ASPECTS OF ORTHOPAEDICS
Richland Memorial Hospital - Radiation Therapy Conference Room
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

3rd TUESDAY 12:30 P.M.
OB/GYN GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital
SPONSOR: USC Dept. of OB/GYN, RMH, MUSC, Spartanburg and Greenville
DESCRIPTION: One of a series of live interactive broadcasts over the HCN, a statewide closed circuit TV network for CME in OB/GYN.
CONTACT: Ronald B. Wade, M.D., (803) 765-7156
FEE: None
CME CREDIT: 1 Hour AMA Category I (per session)

FRIDAYS 8:00 A.M.
PEDIATRIC GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital
SPONSOR: USC School of Medicine, Dept. of Medicine
CONTACT: Warren Derrick, M.D., (803) 765-7211
CME CREDIT: 1 Hour AMA Category I (per session)

WEDNESDAY 12:00 NOON
PSYCHIATRY GRAND ROUNDS
Hall Institute Form
CONTACT: Bonnie Ramsey, M.D., (803) 758-8052
CME CREDIT: 1 Hour AMA Category I (per session)

4th WEDNESDAY 12:00 NOON
PATHOLOGY: MORTALITY TEACHING CONFERENCE
Room 3A110, Building 100, Dorn Veterans' Hospital
CONTACT: Nicholas J. Pappas, Jr., M.D., (803) 776-4000, Ext. 394 or 396
CME CREDIT: 1 Hour AMA Category I

2nd & 4th WEDNESDAY 12:00 NOON
PULMONARY MEDICINE CHEST CONFERENCE
Richland Memorial Hospital, 7th Floor Conference Room
1st & 3rd THURSDAYS 12:00 NOON
3rd Floor Conference Room, Dorn Veterans' Hospital
CONTACT: Gerald N. Olsen, M.D., (803) 733-3112

WEDNESDAYS 6:00 P.M.
ORTHOPAEDICS PROBLEM CONFERENCE
Richland Memorial Hospital Conference Room "P", ACC II
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

THURSDAYS 10:00 A.M.
HEMATOLOGY/ONCOLOGY GRAND ROUNDS
Dorn Veterans' Hospital, 5-West Classroom
CONTACT: George P. Sartiano, M.D., (803) 733-3112

4th THURSDAY 12:00 NOON
G.I. RESIDENTS CONFERENCE
Dorn Veterans' Hospital, 4th Floor Conference Room
CONTACT: John Orchard, M.D., (803) 776-4000, Ext. 673

1st THURSDAY 4:00 P.M.
RADIOLOGY DEPT. CONTINUING EDUCATION CONFERENCE
USC School of Medicine Library Bldg., Room B-116
CONTACT: David F. Adcock, M.D., (803) 733-3295
CME CREDIT: 1 Hour AMA Category I

THURSDAYS 12:00 NOON-1:00 P.M.
ENDOCRINE CASE PRESENTATION
USC School of Medicine Administration Bldg. 2nd Floor Conference Room
CONTACT: Juraj Osterman, M.D., (803) 733-3112

FRIDAYS 7:00 A.M.
ORTHOPAEDIC SUB-SPECIALTY TOPICS
Richland Memorial Hospital - Large Private Dining Room
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

FRIDAYS 9:30-11:30 A.M.
PREVENTIVE MEDICINE GRAND ROUNDS
USC School of Medicine Library Bldg. Room 327
CONTACT: Alan Chovil, M.D., (803) 733-3306
CME CREDIT: 2 Hours AMA Category I

3rd FRIDAY 12:00 NOON-1:30 P.M.

NEUROPSYCHIATRY AND BEHAVIORAL SCIENCES
Dix Conference Room, William S. Hall Psychiatric Institute
CONTACT: Robert J. Pary, M.D., (803) 758-3068

FRIDAYS **1:00 P.M.**
INTERNAL MEDICINE GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital Auditorium
SPONSOR: Dept. of Medicine, USC School of Medicine
AUDIENCE: Internal Medicine and Family Practice Physicians
CONTACT: J. O'Neal Humphries, M.D., Chairman, Dept. of Medicine, (803) 765-6563
CME CREDIT: 1 Hour AMA Category I

SATURDAYS **9:00-10:00 A.M.**
SURGICAL GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital Auditorium
SPONSOR: USC School of Medicine, Dept. of Surgery
DESCRIPTION: Lectures and case presentations given by the department staff and guest speakers
AUDIENCE: Faculty, Residents, Students and Private Clinicians
CONTACT: Carl H. Almond, M.D., (803) 254-4158; James L. Haynes, M.D., (803) 765-7452; Frederick L. Greene, M.D., (803) 776-4000, Ext. 582
FACULTY: Staff of Dept. of Surgery and guest lecturers
CME CREDIT: 1 Hour AMA Category I (per session)

GRAND ROUNDS
Medical University of South Carolina

MONDAYS **8:30-9:30 A.M.**
PATHOLOGY (ext. 3121) Surgical Pathology Conference
Quadrangle - Room E215

MONDAYS **12:30-1:30 P.M.**
RADIOLOGY (ext. 5071) Noon Conference
Hospital — Room B317

MONDAYS **4:00-5:00 P.M.**
RADIOLOGY (ext. 5071) Special Imagining Conference
Hospital — Room B312

MONDAYS
RADIOLOGY (ext. 5071) Visiting Radiologist
Hospital — Room 315B

EVERY OTHER MONDAY **10:00 A.M.-12:00 NOON**
PATHOLOGY (ext. 3121) Pathology Microscopic Roundtable Conference
Quadrangle Building — Room E215

4th MONDAY **2:30-3:30 P.M.**
LABORATORY MEDICINE (ext. 2858) Phlebotomist: Inservice Update Program
Hospital — 2 West Classroom

TUESDAYS **7:00-8:00 A.M.**
SURGERY (ext. 3961) Surgical Grand Rounds - Cancer Conference
2-W Amphitheater —MUH

TUESDAYS **9:00-10:00 A.M.**
MEDICINE GRAND
CONTACT: Jane C. Allen, M.D., (803) 792-2911

TUESDAYS **7:00-8:00 A.M.**
ORTHOPAEDIC SURGERY (ext. 3934) Grand Rounds — Weekly
MUSC — Room 428

TUESDAYS **11:00 A.M.-12:00 NOON**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4050)
Departmental Grand Rounds — MUH Amphitheater

TUESDAYS **12:30-1:30 P.M.**
OBSTETRICS/GYNECOLOGY(ext. 4509)
TV Grand Rounds in Obstetrics and Gyncology
MUH — Amphitheater

2nd & 4th TUESDAY **1:30-3:00 P.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE 577-5011 (ext. 234)
Case Conference
Veterans' Administration Hospital

TUESDAYS (as scheduled) **9:00-11:00 A.M.**
PATHOLOGY (ext. 2456/3121)
Seminar-Tutorial Groups Sessions, Systemic Pathology
Basic Science Building or Quadrangle (where scheduled)

TUESDAYS **8:30-9:30 a.m.**
OBSTETRICS/GYNECOLOGY (ext. 4509) Morning Conferences
Clinical Science Building — Room 624

TUESDAYS **2:00-3:30 P.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4050)
Adult Outpatient Case Conference
University Service Building — Chairman's Conference Room

2nd & 4th TUESDAY **4:00-5:00 P.M.**
PATHOLOGY (ext. 3121) Renal Conference
Basic Science Building — Room 648

1st & 3rd TUESDAY **4:00-5:00 P.M.**
PATHOLOGY (ext. 3121)
Gastrointestinal Pathology Conference (GI Conf)
Basic Science Building — Room 648

WEDNESDAYS (except last) **9:00-10:00 A.M.**
PATHOLOGY (ext. 2131) Graduate Medical Education in Pathology
Basic Science Building — Room 648

LAST WEDNESDAY **9:00-11:00 A.M.**
PATHOLOGY (ext. 3121) Grand Rounds — Pathology
Basic Science Building — Room 648

WEDNESDAYS **10:00-11:00 A.M.**
LABORATORY MEDICINE (ext. 2671) Blood Bank Conference
Quadrangle/Pharmacy — Room 209/310

WEDNESDAYS **12:00 NOON-1:00 P.M.**
PSYCHIATRY & BEHAVORIAL SCIENCE (ext. 4037)
Psychiatry Journal Club
University Service Building — Chairman's Conference Room

WEDNESDAYS **1:00-2:00 P.M.**
LABORATORY SERVICES (577-5011 ext. 466)
Charleston Veterans' Administration Clinical Pathology Conference
Veterans' Administration Hospital — Room B-243

4th WEDNESDAY **2:30-3:30 P.M.**
CYTOTECHNOLOGY/HISTOTECHNOLOGY (ext. 2041)
Histotechnology Journal Club
Quadrangle — Room QE 215

WEDNESDAYS **3:00-4:00 P.M.**
PATHOLOGY (577-5011 ext. 466)
Charleston Veterans' Administration Medical Center Tumor Board
Veterans' Administration Hospital

WEDNESDAYS **3:00-4:00 P.M.**
LABORATORY MEDICINE (ext. 2933) Hematology Conference
Quadrangle — Room B-106

WEDNESDAYS **6:30 P.M.-?**
OBSTETRICS/GYNECOLOGY (ext. 4509)
Monthly Journal Club Meeting — Outside Location

WEDNESDAYS **6:00-7:00 P.M.**
RADIOLOGY (ext. 5071) Low Country Ultrasound Society
Hospital — Room B-317

THURSDAYS **8:30-9:30 A.M.**
OBSTETRICS/GYNECOLOGY (ext. 4509) Morning Conference
Clinical Science Building — Room 624

THURSDAYS **8:00-9:00 A.M.**
RADIOLOGY (ext. 5071) Teaching Conference in Neuroradiology
Hospital — Room B-317

THURSDAYS **8:30-10:00 A.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4037)
Psychiatry Youth Conference — Clinical Science Building - Room 623C

THURSDAYS **8:30-10:00 A.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4037)
Teaching Case Conference for Consultation/Liaison Service
Clinical Science Building — Room 623C

THURSDAYS **8:30-10:00 A.M.**
PSYCHIATRY (ext. 3051) Child Psychiatry Seminar
Clinical Science Building — Room 623C

THURSDAYS **9:30-10:30 A.M.**
NEUROSURGERY (ext. 2421) Neurosurgery Clinical Conference
Clinical Science Building — Room 428

THURSDAYS **10:30-11:30 A.M.**
NEUROLOGY (ext. 3221) Neurology Grand Rounds
Clinical Science Building — Room 300

THURSDAYS **10:30-11:45 A.M.**
NEUROSURGERY (ext. 2421) Neurosurgery Lecture
Clinical Science Building — Room 300

THURSDAYS (as scheduled) **9:00-11:00 A.M.**
PATHOLOGY (ext. 2456/3121)
Seminar-Tutorial Group Sessions, Systemic Pathology
Basic Science Building or Quadrangle (where scheduled)

THURSDAYS **12:00 NOON-1:00 P.M.**
PATHOLOGY (ext. 3581/3121) Neuropathology Conference
Basic Science Building — Room 737

THURSDAYS **1:00-2:00 P.M.**
PATHOLOGY & DERMATOPATHOLOGY (ext. 3821/3121)
Dermatopathology Conference — Quadrangle-Room E215

THURSDAY (once/month) **2:30-3:30 P.M.**
LABORATORY MEDICINE (ext. 2671)
Immunohematology Journal Club — Quadrangle Room 104

THURSDAYS **4:15-5:30 P.M.**
NEUROSURGERY (ext. 2421) Neurosurgery Didactic Lectures
Clinical Science Building — Room 428

1st THURSDAY **5:30-7:30 P.M.**
NEUROSURGERY (ext. 2421) Journal Club

FRIDAYS **8:30-10:00 A.M.**
MEDICINE/ENDOCRINOLOGY (ext. 2528)
Endocrinology Journal Club, Endocrinology Research Conference
Clinical Science Building — Room 910

FRIDAYS **10:00-11:30 A.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE
Teaching Case Conference, Adult Inpatient
MUH — Room 7W Conference Room

FRIDAYS **12:00 NOON-1:00 P.M.**
PATHOLOGY (ext. 3556/3121) Clinico-Pathologic Conference (CPC)
Mu Hospital — Room 2W Ampitheater

FRIDAYS **2:30-4:00 P.M.**
MEDICINE (ext. 2000) Division Rounds (Case Conference)
of the Division of Rheumatology & Immunology
Clinical Science Building — Room 912

FRIDAYS **4:00-5:30 P.M.**
MEDICINE/ENDOCRINOLOGY (ext. 2528)
Endocrinology Case Conference
Clinical Science Building — Room 906E

FRIDAYS **8:30-9:30 A.M.**
PATHOLOGY (ext. 3121) Surgical Pathology Conference
Quadrangle — Room E215

FRIDAYS **12:30-1:30 P.M.**
RADIOLOGY (ext. 5071) Noon Conference
Hospital — Room B317

FRIDAYS **4:00-5:00 P.M.**
RADIOLOGY (ext. 5071) Special Imagining Conference
Hospital — Room B312

FRIDAYS
RADIOLOGY (ext. 5071) Visiting Radiologist
Hospital — Room 315B

FRIDAYS **8:30-9:30 A.M.**
OBSTETRICS/GYNECOLOGY (ext. 4509) Morning Conferences
Clinical Science Building — Room 624

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THE ROLE OF SPUTUM CYTOLOGY IN THE DETECTION AND TREATMENT OF CARCINOMA OF THE LUNG*

JOE W. R. BOLTON, M.D.
DARRYL S. WEIMAN, M.D.
GERALD N. OLSEN, M.D.**
JAMES L. HAYNES, M.D.

In 1887, Hampeln first used cytologic examination of sputum to diagnose lung cancer.[1] Sixty-two years later, Papanicolaou discussed the potential of exfoliative cytology in the diagnosis of cancer[2] and in 1951 described carcinoma-in-situ of the right lower lobe bronchus diagnosed via exfoliative cytology.[3] Since that time, especially in the past two decades, cytologic examination of sputum has been studied in order to determine its exact role in the diagnosis and treatment of carcinoma of the lung. This review hopes to correlate the findings and conclusions of the recent literature concerning sputum cytology and present suggestions for its utilization in relation to lung cancer.

The need for improved means of detection for lung cancer is illustrated by the 75 to 90 percent mortality rate of the disease. Nearly all cures are due to surgical extirpation which requires that the disease be limited in extent. Chest roentgenograms can detect tumor densities as small as one centimeter in diameter. Unfortunately, this represents 75 percent of the tumor life cycle and the tumor has usually metastasized by this time.[4] Without means of earlier diagnosis the outlook is unlikely to be improved. Cytologic examination of sputum for exfoliated tumor cells may provide the needed reliable early detection.[5]

Farber has shown that the effectiveness of sputum cytology is actually greater during the early stages of the tumor when it is most susceptible to treatment and cure rather than later when the tumor becomes detectable by other means such as x-ray.[6] This is particularly true of squamous cell carcinomas and is explained by the fact that "squamous cell carcinomas originate centrally and grow as a sheet replacing the mucosa and escaping radiographic detection but readily desquamating malignant cells into the sputum."[7]

The pathologic changes in the exfoliated cells found in sputum can be detected anywhere from one to 10 years prior to the development of symptoms caused by cancer.[8-11] Saccomanno *et al.* concluded that in the development of lung carcinoma reflected by exfoliated cells there is an orderly progression of cellular morphology.[8] They showed that cells progressed from normal through mild, moderate, and severe atypia, then carcinoma-in-situ, and finally invasive carcinoma with an average of two to three years duration at each stage. They also stated, however, that there may be occasional skip stages or sudden changes in the progression.[8]

COLLECTION OF SPUTUM SAMPLES

The proper collection and preparation of specimens is important to accurate interpretation. Different studies have demonstrated varying results related to the collection of sputum via aerosol induction as compared with spontaneous cough collection.[12, 13] Frost *et al.* concluded that aerosol induction prior to collecting spontaneous cough specimens was superior to simple spontaneous deep cough specimens alone.[13] Melamed *et al.*, on the other hand, found no difference in the detection of lung cancer when comparing the two methods.[12]

A common sense approach may be utilized by first allowing the patient to attempt spontaneous early morning deep cough sputum collection. If an adequate specimen is not obtained, then one may resort to deep cough induction by the use of a hypertonic saline aerosol. Whether relying upon spontaneous or induced deep cough for sputum

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production, the yield of both may be improved by the use of early morning chest physiotherapy.

Another important aspect of sputum collection is the fact that the yield increases greatly with the number of adequate specimens. An adequate specimen is defined as one containing alveolar macrophages. The diagnostic yield of a single properly collected sample may be only 40 percent whereas four properly collected specimens will increase the yield to 80 to 85 percent.[14] Furthermore, yields as high as 90 to 95 percent can be obtained if five or more adequate samples are collected.[15, 16]

Methods of transport of specimens have been studied. One method is to collect the specimen and immediately transport it to the pathologist without fixation. Another method is to allow the patient to collect the sample in a container with 50 percent alcohol and two percent polyethylene glycol as a fixative.[17] The key is to allow the shortest period of time from collection of the specimen to fixation.

INTERPRETATION

Pathologic interpretation of specimens is critical. A good cytopathologist may be able to examine effectively eight to 10 sputum samples per day with only 15 to 20 percent providing positive diagnostic results. Only one-fourth of this 15 to 20 percent will come from patients with lung cancer.[18] In an attempt to overcome this problem, competent cyto-technicians have been used to screen samples for the pathologist.

Systems of microspectrophotometric analysis utilizing a computerized scan of sputum cells using the Saccomanno method discussed earlier are also being developed. One such scan is a new system known as the Atypia Status Index which mathematically evaluates sputums for cytology in suspected squamous cell carcinomas. This system works by electro-optical scanning of the sample with associated statistical analysis which produces an atypical status index. This offers a major advance in the use of sputum cytologies since "a standardized method of quantitative assessment is used and the results are uniform and may be repeated at other research centers."[19] This will reduce the time demands on the pathologist while allowing for increased use of sputum cytological examination for screening since major changes in cytology will be detected. This system specifically classifies cells into five classes of progressive atypia and actually quantitates the degree of atypia in each cell. Each of the five classes (squamous metaplasia, mild atypia, moderate atypia, severe atypia and carcinoma) have different profiles that are consistent and statistically significant. When the system was tested on proven pathological data the classification accuracy of the procedure was more than 99 percent.[20]

SCREENING

The role of sputum cytology as a screening mechanism for populations at risk of developing lung cancer has been studied. Currently, chest roentgenograms and sputum cytological examinations are the only potentially useful methods for screening asymptomatic groups to detect potentially curable lung cancer.[21, 22] Results of controlled clinical trials involving persons at high risk for the development of lung cancer have not yet shown any notable difference between the mortality of the screened groups and the mortality of the control groups.[23-25] Although most studies have thus far failed to show any change in mortality in the screening, there may still be advantages to screening selected high risk groups exposed to known carcinogens such as nickel, uranium, and asbestos.[26] In addition, there remains the possibility that screening by sputum cytological examination may have an effect on mortality as studies continue since "sputum cytology when positive for malignant cells in clinically and radiographically occult carcinomas, detection and treatment at stage O, yield a very high cure rate."[27]

Finally, Clee and others have found that, in practice, sputum cytology can be expected to diagnose between 50 to 60 percent of an unselected series of lung cancer patients.[18, 28, 29]

CELL TYPE

If cytologic exam of the sputum is going to be useful in early detection and treatment of lung tumors, it must also provide accurate histological determination of the tumor. For example, small cell carcinoma of the lung can be better treated with chemotherapy and is not generally considered surgically resectable for cure. The accuracy of sputum cytology for histologic typing has been studied for Johnson and Bossen who concluded that, when compared with biopsies and post-mortem samples, cytopathic interpretation may be more accurate than tissue examination, and there-

fore, it is capable of providing accurate histologic typing of lung cancers.[30] They further concluded that the highest level of correlation between tissue diagnosis and cytopathic diagnosis was for small cell undifferentiated carcinoma (95.5 percent agreement).[30] This level of specificity may allow one to proceed confidently to treatment without further diagnostic evaluation.

When comparing histological cell typing, Payne *et al.* found that they could accurately predict the true histologic cell type in 89 percent (143/161) of their sputum cytologies that showed bronchogenic carcinoma.[31] This was better than needle biopsy which was accurate in only 62 percent (41/66).[31] Their greatest difficulty was in differentiating the large cell carcinomas. In their study bronchial biopsies were correct in 92 percent (233/254).[31] This study seemed to show that bronchoscopic biopsies were better than sputum cytologies in predicting the true cell type of bronchogenic carcinoma.

Along with the previously mentioned paper by Johnston and Bossen, an argument for the histologic accuracy of sputum cytologic examination is supported by Gupta's study on the differential diagnosis of alveolar cells versus bronchogenic adenocarcinoma. Gupta showed that sputum cytology alone is not only valuable in detecting malignant cells, but can correctly type all cases of alveolar cell carcinoma and over 90 percent of bronchogenic adenocarcinoma. This was accomplished by examination of cell size, clustering effects, pleomorphism, mucin production, cytoplasm, nucleoli and nuclei.[32] This group found that examination of cellular pleomorphism and mucin production were the most important differentiating features.

It should be remembered, however, that "a bronchoscopic biopsy positive for malignancy is still the most valuable preoperative finding."[33]

FIBEROPTIC BRONCHOSCOPY VERSUS SPUTUM CYTOLOGY

Numerous papers comparing the procedures used in the diagnosis of lung cancer have been published with widely varying results. For example, Chaudhary *et al.* found that the highest diagnostic yield was from bronchial washings (75.4 percent) followed by forceps biopsy (65.8 percent) and that a combination of the two provided a diagnostic yield of 95.8 percent. They also stated that brush biopsy was most useful when the lesions were visualized by bronchoscopy whereas the yield was low when the lesion was not visualized. In addition, they suggested that post-bronchoscopic sputum examination is also highly important in the diagnosis of lung cancer and should be performed routinely.[34]

A different opinion has been expressed by Mohsenifar and his group in discussing the value of fiberoptic bronchoscopy in metastatic pulmonary tumors. This group concluded that "cytologic examination of pre-bronchoscopic sputum may be as useful as bronchial brushings and washings in diagnosing cancer metastatic to the lungs in patients who have visible endobronchial involvement."[35] They further elaborated that sputum examination in metastatic pulmonary tumors is often of no diagnostic value when endobronchial lesions are not seen. In a later paper discussing fiberoptic bronchoscopy in lung cancer presenting as mediastinal masses, this same group concluded that washings and brushings were useful in diagnosing those masses but that "sputum cytology gives very low yield (eight percent)."[36] This may be because metastatic lesions do not usually present as endobronchial lesions and therefore cannot shed tumor cells into the tracheobronchial tree.

It is therefore possible to conclude from these studies that sputum cytological examination in metastatic disease is most reliable when there is an endobronchial lesion. In addition, sputum cytology seems to have little to offer in the detection of mediastinal or non-endobronchial lesions.

Korompai and Hayward developed a slightly different conclusion stating that "sputum cytology is not an effective, generally applicable diagnostic approach to suspected lung cancer."[37] They suggest it only be used in those patients in whom positive sputum would direct therapy other than surgery.

CHEST ROENTGENOGRAMS VERSUS SPUTUM CYTOLOGY

Chest x-ray is currently the only test other than sputum cytology to have any proven value in detecting pre-clinical lung cancer.[21] Years ago it was suggested that screening chest x-rays be done yearly to aid in the early detection of lung cancer. However, this was abandoned, possibly prematurely, since it had been ineffective in reducing mortality from the disease.[38-41]

Recently the National Cancer Institute Early

Lung Cancer Detection Program included arms which assessed the use of chest x-ray and sputum cytology, both together and separately, as screening tools. The Sloan-Kettering involvement revealed that all cancers detected by sputum cytology were squamous cell carcinomas and that two-thirds of the malignancies detected by chest x-ray were adenocarcinomas.[42] The Mayo Clinic trial had similar findings in that two-thirds of all lung cancers were detected by chest x-ray alone, one-half of these being resected.[43] Only one-fifth of the lung cancers were detected by sputum cytology alone; however, all but one of these were resected.[43]

Most studies agree that chest roentgenograms are superior for detection of peripheral lesions and that sputum cytology will detect centrally located squamous cell carcinomas earlier than chest x-ray.[43]

Despite the delay in the detection of cancer by chest x-ray, Melamed *et al.* found that mortality was the same suggesting that the squamous cell cancers detected by sputum cytology are very slow growing and remain localized until detected by x-ray.[44] Melamed *et al.* also noted that the major impact of cytology compared to chest x-ray was at the initial screening.[44] In addition, if sputum cytology was not performed as a part of the screening, the same number of lung cancers were eventually identified by chest x-rays but at a later date.[43] Because of this, Melamed *et al.* recommend that cytology is not required in a screening program of annual chest x-rays.[44] However, the Mayo Clinic group has concluded that "chest x-ray and sputum cytology are complementary procedures that remain the most effective techniques for detecting asymptomatic lung cancer."[43]

POTENTIAL PROBLEMS IN SPUTUM CYTOLOGY

Many investigators have identified problems and errors in utilizing sputum cytology. Saccamanno has shown a histological progression from minimal to high grade malignancy.[8] Oswald counters that histological staging of lung cancer is difficult with exfoliative cytology.[18] Other data suggest an average false positive rate of three percent and rare false negative results from adequate sputum samples.

Another limitation of cytology is the lack of specificity in locating the source of abnormal cells. That is, the site of production is not determined by sputum exam alone. In addition, there is concern that the diagnostic accuracy is better for central lesions than peripherally located tumors.

If sputum cytology alone is used for screening without concomitant chest x-ray or if chest x-ray reveals no lesion with positive cytology it is of utmost importance to exclude upper aerodigestive tract lesions such as oral or laryngeal carcinomas.

Advantages of sputum cytology are that it may be very likely to yield a positive result, and it provides quick results with minimal trauma to the patient.[45] However, patient cooperation is necessary for maximal results.

CONCLUSIONS

From this review it is clear that sputum cytology used as a screening technique can be a quick, simple, non-invasive and economical method of screening for lung cancer in a select population. "Maximal cost effectiveness can be achieved in screening a cigarette-smoking male population, by limiting the examinations to men older than 55 years of age"[42] in association with a comprehensive examination of the oral cavity and pharynx to include direct and indirect laryngoscopy in the event of positive cytologies.[42]

At present the value of screening sputum cytology seems to be limited to the detection of radiographically occult centrally located squamous cell carcinomas arising in the major bronchi.[46]

It is apparent from this review that the best screening mechanisms currently available for the detection of asymptomatic lung carcinoma consist of yearly chest x-ray with sputum cytology limited to high risk patients including those exposed to known carcinogens as well as cigarette smokers greater than 55 years old.

Unless there is a regular, trained team which collects sputums for cytology, it is wise for the physician or his delegate to personally collect early morning, deep cough sputums in order to assure adequate samples. Even with adequate samples, errors may occur by confusing cancerous cells with those of inflammatory disease, radiation therapy changes, degenerating leukocytes, and different histological types of cancer. When given adequate background on the patient, a skilled cytopathologist can interpret sputum specimens with greater than 90 percent accuracy.

Rather than attempting to define an exact role for sputum cytological examination, the physician

should utilize his clinical judgment in evaluating the history, physical examination, x-ray studies and biochemical tests in order to decide which patients may benefit from examination of sputum cytologies for malignancy. Sputum cytology should just be one arm in the clinical staging of the patient with a bronchogenic carcinoma who is a candidate for resection. □

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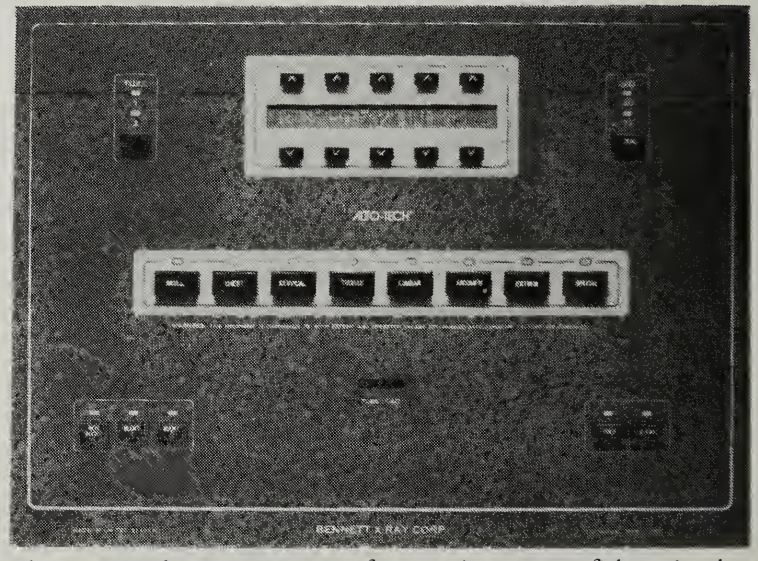
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USE OF BRACHYTHERAPY IN LUNG CANCER*

CAROLYN E. REED, M.D.**
RICHARD D. MARKS, JR., M.D.
FRED A. CRAWFORD, JR., M.D.

Brachytherapy or interstitial implantation refers to the use of radioactive sources placed within or in close proximity to a malignant tumor. Use of brachytherapy in thoracic surgery dates back to 1933 when Graham inserted seven radon seeds into a bronchial stump after completion of a left pneumonectomy. The largest experience with the application of brachytherapy to lung carcinoma has been accumulated at Memorial Sloan-Kettering Cancer Center in New York City. The modern era of brachytherapy began in 1955 when Henschke introduced a new afterloading technique.[1] He also introduced the use of two artificial high-energy radionuclides: Gold-198 and Iridium-192. In 1965, a low-energy radionuclide, Iodine-125, was introduced that has a low-energy gamma emission (30 KV) and a long half-life (60 days). Because the encapsulated source could be stored for long periods, most of the experience at Memorial has been reported using this radionuclide.

APPLICATION OF BRACHYTHERAPY TO LUNG CANCER

Nearly one-half of patients with lung cancer will present with mediastinal lymph node metastases. For those patients whose disease is confined to the chest and in whom mediastinal lymph node metastasis is the only site of tumor spread, there exists a subset of patients who are candidates for complete resection of disease and, in this group, overall five-year survival is 29 percent.[2] However, this subset constitutes only 21 percent of the total N_2 group. In addition to N_2 disease, unfavorable location may make tumor resection difficult or hazardous, and resection may be limited by a patient's poor pulmonary reserve.

Brachytherapy combined with external radiation can be more effective in achieving loco-regional control of these unresectable cancers. The likelihood of better tumor control is based on the following advantages:

1. A higher dose can be delivered to the tumor than by external beam irradiation.
2. The dose is more accurately adapted to tumor size and shape.
3. The dose delivered to normal tissues is less with an implant because of rapid fall-off of radiation.
4. Brachytherapy procedure time is short.

Patients selected for interstitial implantation must be capable of undergoing a thoracotomy. Therefore, their cardiopulmonary status must be assessed preoperatively. The CT scan is of critical importance in evaluating potential feasibility of implantation. Tumor size should probably not exceed 6 cm in average dimension. Larger tumors may be treated by partial resection to reduce tumor bulk. If a high-energy radionuclide, such as Gold-198 is used, the seeds must be ordered in advance. One advantage to Iodine-125 is its availability on short notice secondary to its long storage time. Except for small cell carcinoma, which is better treated by chemotherapy and external beam radiation therapy, histology is not a contraindication to implantation.

TECHNIQUES OF IMPLANTATION

Brachytherapy may be permanent and/or temporary. Permanent implants are interstitial radioactive sources that are permanently left in the tissue (Figure 1). Temporary or "removable" implants are interstitial implants in which radioactive sources are removed after the desired dosage is achieved. An afterloading technique is characterized by two distinct phases: insertion of unloaded needles and the afterloading with radioactive sources. The thoracic surgeon exposes the tumor and clearly delineates the hilar vessels and major structures of the mediastinum (trachea, esophagus, vena cava, aorta, etc.). The number of required sources is based on the dimensions of the tumor and the radioactive strength of the sources.

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Hollow needles are inserted into the tumor mass (Figure 2). Using a commercially available implantation device, the seeds are loaded into each needle and then the needle withdrawn (Figure 3).



FIGURE 1. Permanent I-125 implantation of a superior sulcus tumor.

Temporary interstitial implantation is accomplished via special afterloading catheters that are inserted at the time of thoracotomy. The catheters are threaded through hollow steel needles placed in the chest wall at premarked positions, and the needles removed while holding the plastic catheters in the chest. The number of ribbons needed are calculated by a "planar implant guide" based on the active length of iridium, area to be covered, and seed strength. Each catheter with its inner steel cable is placed in the desired position in the mediastinum and secured to the parietal pleura with absorbable sutures. The catheters are secured to the skin with steel buttons. The radioactive sources (Iridium-192) are afterloaded into the catheters three to five days after surgery. The catheters are easily removed after the calculated time of implantation has ended.



FIGURE 2. Insertion of needles into a carcinoma of the left upper lobe.



FIGURE 3. Loading I-125 seeds into tumor.

RESULTS

From 1956 to 1976, 470 patients at Memorial Sloan-Kettering Cancer Center were treated by permanent interstitial brachytherapy.[2] These patients were staged retrospectively. Only 18 patients were Stage I or II. If satisfactory implantation was carried out, no further external radiation was added. If all gross tumor could not be implanted, if the dose distribution curve was not adequate, or if there were positive mediastinal nodes, external RT was also given. Local control (no evidence of recurrence in the treated area at the most recent follow-up or at death) was achieved in 68 percent of the patients. Locoregional control was obtained in 71 percent of Stage III patients with negative nodes (N_0) and 63 percent of patients with positive N_2 nodes. (In spite of good local control, brachytherapy did not translate into prolonged survival for Stage III patients — eight percent five-year survival for T_3N_0 and three percent five-year survival for the N_2 group.)

Since 1977, Iodine-125 implantation of the primary tumor has been combined with temporary Iridium-192 implantation of the mediastinum. Eighty-eight patients with non-oat cell carcinoma of the lung with mediastinal lymph node metastases (N_2) were treated with this combined method.[3] The primary tumor was resected in 29 patients, incompletely resected in 36 patients, and only biopsied in 23 patients. All patients underwent afterloading of the superior mediastinum with temporary Iridium-192 catheters. Locoregional control was obtained in 76 percent of the patients. Two-year actual survival was 51 percent. The two-year survival varied according to the completion of resection of tumor: 70 percent versus 30 percent. Five-year survival has been approximately 20 percent in the group of patients with a superior sulcus tumor who have no resection or an incomplete resection.

It is clear that brachytherapy or local radiation has a role in the management of lung cancer. It should be considered in patients who have unresectable primary tumor and/or unresectable N_2 disease. This form of treatment of lung cancer became available at the Medical University of South Carolina in July 1985, and a growing series of patients treated in this manner is being carefully followed to assess locoregional control, long-term survival, and pattern of recurrence. □

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AMERICAN CANCER SOCIETY®

THE BENEFITS OF A HOSPITAL TUMOR REGISTRY

KAREN ANDREWS, R.R.A., C.T.R.*

A Tumor Registry is a data system designed for the collection, management, and interpretation of data on persons with cancer. The registry is a system designed not only to monitor all types of cancer diagnosed and treated, but also to insure lifetime follow-up of each cancer patient.

Identification of cancer patients is coordinated through the Tumor Registry by collecting information from the following sources:

Medical Records (hospital discharges)
Radiation Therapy reports
Pathology reports
Oncology Clinic records
State Cancer Clinic records

A list of patients discharged with the diagnosis of malignant neoplasm is obtained through the Medical Records Department, of which the Tumor Registry is an entity. This information identifies all patients with an active cancer diagnosis and is used to determine if the case has been previously registered. A new, analytic case is accessioned and abstracted in the calendar year that the patient receives treatment at the hospital. Previously registered case abstracts are updated by subsequent treatment, last follow-up date, and tumor status.

A Tumor Registry data base consists of essential core information on patients treated in the hospital as an in- or out-patient. The core information is recorded on the patient abstract. Listed below is the basic information in a registry:

Name
Address
Date of birth
Primary site
Histology
Stage of disease
Diagnostic confirmation
Treatment modalities
Date of diagnosis
Paired organ
Subsequent treatment
Date of last contact or date of death

Once this information is collected in the registry it is indexed by primary site and calendar year for easy accessibility. It is true that a registry data set does not provide all the possible variables considered important to everyone, but the preliminary data collection begins in the Tumor Registry. The medical record is the primary source of a detailed comprehensive study.

As previously stated, one of the main functions of the Tumor Registry is to insure lifetime follow-up of each cancer patient by monitoring the patient's progress on an annual basis. This service is a direct patient benefit because it serves as a reminder to the physician, and when necessary, to the patient. This annual follow-up reminder is of particular benefit to the older patient who may need reinforcement of patient education or other assistance due to physical impairment or lack of transportation. Continuity of care by means of a lifetime follow-up system is one of the requirements of an approved Hospital Oncology Program. Continued surveillance assures early detection of possible recurrence of disease or a second primary site. The follow-up system evaluates adherence to systematic health practices. Patients are usually very grateful that a physician or the follow-up service expresses the interest and concern to contact them. This personal contact helps to promote goodwill and improved public relations which serves to uphold an image that the hospital wishes to maintain.

Another Tumor Registry function is to coordinate the Hospital Oncology Program Annual Report and provide statistics on cancer incidence by site, age, sex, race, and stage of disease. This report may include additional distributions by primary site and patient survival, number of oncology discharges by service, the demographics of each county, and other information pertinent to an oncology program. The report includes a narrative from the Oncology Committee on the overall cancer program. Included also in the report are patient care evaluation studies completed during

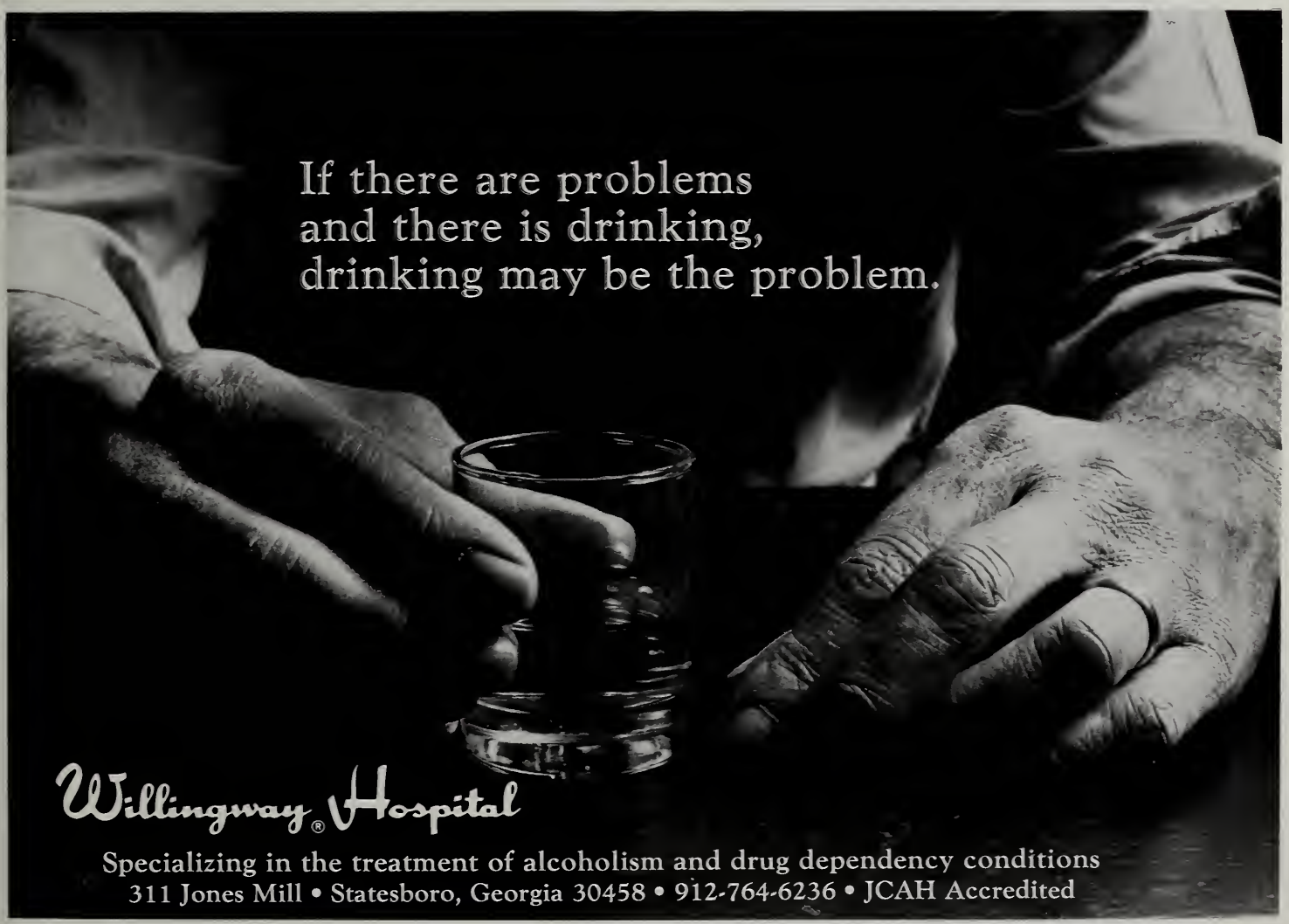
* Tumor Registrar, Richland Memorial Hospital, 3301 Harden Street, Columbia, S. C. 29203, and State President, Tumor Registrars Association.

the year which may be compared to regional and national data.

By merely perusing the Oncology Program Annual Report, facts may be obtained in order to begin a more in-depth study. The annual report is also of value in identifying cases for studies and research investigations. The registry provides assistance in data retrieval for special studies.

Professional recognition for the tumor registrar is provided through the National Tumor Registrars Association. The Association was founded by tumor registrars and chartered in 1974 and has continued to strive for well trained personnel. In March of 1983 the first certification examination for tumor registrars was administered. Certification examinations are administered on an annual basis. Successful completion of this examination allows one to use the credential CTR, Certified Tumor Registrar. Continuing education hours are required to maintain this credential status. Twenty continuing education hours are required for each two-year cycle, five hours of which may be acquired through attendance at Hospital Tumor Board Conferences. The National Tumor Registrars Association continues to promote research and education in Tumor Registry administration and practice so that the registrar may be of greater service to the cancer patient.

In conclusion, the important reasons for maintenance of a tumor registry are lifetime patient follow-up and evaluation, education, research, and administrative planning. Registry data will continue to be used to identify trends in cancer incidence, distribution and treatment, and to measure end results of treatment, especially the newer treatment modalities. Careful analysis of accurate registry data verifies actual treatment success or failure which has definite educational value and future treatment roles. The Tumor Registry is of paramount importance for optimal cancer program planning and for administrative planning for allocation of hospital resources. □



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Vol. 6, Issue No. 9 September 1986

DIRECT INVESTMENTS: WHAT'S IN STORE?

(Cont'd from Last Month's Issue)

Real Estate

1986 will be a transitional year for the real estate industry as activity and the investment environment adjust to a long period of overbuilding. However, according to the Real Estate Research Corporation, a national consulting organization, activity in selected sectors will remain high, with developers completing projects and leasing buildings. So, this year may be opportune for a variety of real estate investments.

Real estate will continue to be a major area for direct investment activity for Hutton. Careful analysis will continue to be made of geographic areas to identify growth markets. Hutton will also look at a wide variety of properties as investment vehicles for clients. These include traditional residential and commercial buildings, plus other types of properties that show strong profitability potential such as office buildings, industrial centers, research and development facilities and shopping centers.

Leverage (the use of borrowed money) can enhance investor benefits by increasing the partnership buying power. It also increases risk. Programs offered by Hutton will contain various degrees of leverage to help investors meet their financial goals. Where properties are purchased using all-cash or low leverage, options may exist to use or increase benefits to investors.

Excellent direct investment opportunities may exist in special niches in the real estate industry:

Manufactured Housing Communities

Manufactured housing communities are increasingly becoming attractive and affordable to traditional home buying for middle-income Americans. Public perception of these communities has improved over the past decade as better quality parks have been built and in 1984, manufactured housing accounted for 82% of all new single-family homes priced under $50,000 sold in the U.S. **

Once these communities reach a high occupancy level - the types of properties Hutton-sponsored partnerships seek - they tend to remain this way. And, since most General Partners seek to "add value" to the properties over the holding period, Partnerships can potentially benefit from increasing cash flow and capital appreciation.

Self-Storage Facilities

Demand for these facilities has grown enormously as the need for residential and commercial space has intensified, but the supply of available space in offices and homes has dwindled. As a result, the self-storage industry has grown in recent years, to where asset values are now over $6 billion, with over 8,000 facilities nationwide offering more than 200 million square feet of space. The Self-Service Storage Association projects that this demand will continue to grow.

Investing in a self-storage facility can make good economic sense. Operating margins of these facilities tend to be high due to low maintenance expenses, a highly favorable rent-to-construction cost ratio and flexible rent structures that can respond to the need for increases in a short time.

Hotels

Hutton will take an opportunistic approach to the hotel industry, reviewing potential programs on aninvestment-by-investment basis. Investor guarantees a major objective in structuring these programs.

One strong, emerging niche in the hotel industry is the all-suite hotel. The concept behind this type of hotel is to offer guests 2-room suites at prices comparable to those of standard rooms at other first-class hotels. As a result, all-suite hotels have a higher occupancy level than the industry average, consistently out-performing their competitors in virtually all markets.**

One important trend to note is that domestic travel has become a more attractive option for many people because travel and energy costs are down from recent years.

* * * * * * * * * * * * * * * * * * * *

The information contained herein has been obtained from sources believed reliable, but is not necessarily complete and cannot be guaranteed. Any opinions expressed are subject to change without notice. Neither the information presented nor any opinion expressed constitutes a representation by us or a solicitation of the purchase or sale of any securities. South Carolina Medical Association and E.F. Hutton & Company, Inc. 1986.

If you would like to receive further information on any of the topice covered in this newsletter, please write to Martin Lefkowitz, CFP, E.F. Hutton & Company, Inc., 2700 Middleburg Drive, Suite 200, Columbia, SC 29204; or Call (800) 922-1112.

Editorials

CANCER CARE AND PROSPECTIVE PAYMENT: *PRIMUM NON NOCERE*

In the last several years, all physicians have been plunged into the world of the competitive market place. From the standpoint of Health Maintenance Organizations and Diagnosis Related Groups (DRG's) in dealing with our patients supported by federally mandated programs, we have only seen the tip of the iceberg. To those of us who are primarily involved in the care of cancer patients, the impact of government direction and intervention is of concern.

All of us have felt the impact of having to tailor "patient care" to fit into a given number of hospital days as mandated by specific DRGs. In dealing with patients with oncologic problems, it becomes even more difficult to speculate on the length of time needed for inpatient care. Since cancer care represents such an impact on institutions, it is obvious that hospital directors cannot be expected to remain neutral on this issue. A recent survey by Health Economic Research Inc., of Chestnut Hill, Massachusetts, reported that "two out of every three physicians claimed that hospitals have reacted to Medicare's prospective pricing system by pressuring them to discharge patients earlier than in the past." Recent congressional inquiries and presentations by various interest groups have supported the concept that the consumer is concerned about the need to be discharged from the hospital earlier than indicated. One of the important "spin-offs" from this has been the shift from inpatient to outpatient support of the oncology patient. The American Hospital Association reported that admissions have dropped 5.2 percent in the twelve month period ending February 1985, while outpatient treatments rose 1.5 percent in the same period.

What about the cancer patient? The initial report of the Association of Community Cancer Centers DRG Research Program reviewed data on approximately 8,500 cancer patients who were discharged from 25 institutions. The findings showed that cancer patients, in general, lose money for hospitals. As an example, DRG 410 provides reimbursement for patients admitted to the hospital for chemotherapy and most institutions allow payment for three days in-hospital. If patients are included in protocols, which utilize four-or-five-day infusions, it is obvious that the "protocol" patient becomes at odds with the system. In our desire to work in defined protocol situations to enhance our knowledge of overall cancer care, it becomes obvious that there will be ethical and pragmatic implications based on DRG pressures alone.

The entire area of cost containment will inevitably lead to placing constraints on the development of innovative technology which increases the overall expense of cancer treatment. Many of our cancer patients have benefited from spectacular technological advancements over the last several years and it is this group which obviously will be affected by reduction in technology. What legislators and others involved with "certificates of need" must realize is that more expensive technology will actually decrease the overall cost of diagnosis since fewer and fewer tests may be required to sort out the difficult problems of our cancer patients. Although the short term costs of technology may be high, the long term effects may be quite cost effective.

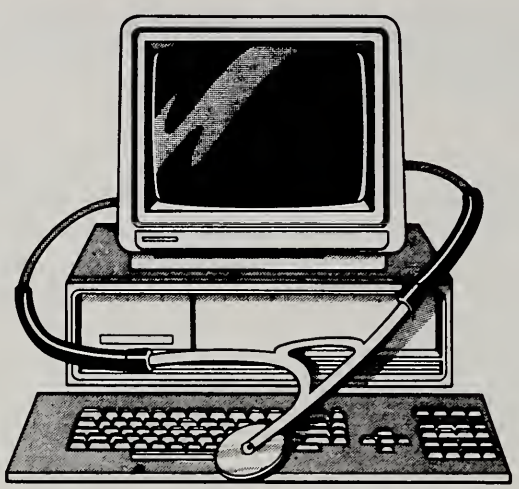
We are on the threshold now of seeing the development of physician DRGs which obviously will have an impact not only on our cancer patients, but on the relationship of patients to their physicians. It is clear that these concepts of cost containment and competitive medicine, especially those that pertain to our oncology patients, must always be evaluated in terms of their ethical and humanistic implications. Although prospective payment will drastically alter the fiscal structure, our humanistic approach to medicine in our state and country at-large must always be maintained.

FREDERICK L. GREENE, M.D.,
Guest Editor

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President's Page



THE SOUTH CAROLINA CIVIL JUSTICE COALITION

After spending almost a year in what — to this point — has been a singularly unsuccessful effort at meaningful tort reform, SCMA is now formally in "coalition" with other business and professional organizations to achieve those goals.

At the time of this writing, you will have just received a letter from me to all South Carolina physicians, encouraging you to join, as individuals, the South Carolina Civil Justice Coalition. Here, in concert with CPAs, builders and architects, Chambers of Commerce, defense trial lawyers, railroads, several different branches of the insurance industry and others, we will mount our plan to approach the South Carolina General Assembly with a bill designed to secure changes in the tort system which will benefit all groups, and — more importantly — all South Carolinians.

The coalition now consists of at least thirty member organizations. The bill we will support has been authored by Senator John Courson of Richland County and Senator Bill Doar of Georgetown County. Senator Courson is in the insurance business; Senator Doar is an attorney who deals principally in defense trial activities. The bill is not a great deal different from the tort system changes suggested by SCMA's ill-fated endeavor of the legislative session just concluded. It suggests changes in the statute of limitations; it asks for judges to be apprised of collateral sources of payment; it asks for a "cap" on non-economic damages of $250,000. In addition, it tries to correct the problems of "joint and several liability," which can make a party attached only tangentially and casually to a tort action liable for a lion's share of the award. It also suggests an intelligent approach to "punitive damages," making them payable not to the plaintiff but to the general fund of South Carolina.

The coalition steering committee has included our exec, Bill Mahon. I will be, along with some imfluential South Carolina citizens, on the advisory board. We have hired a public relations firm and a lead lobbyist. We have set for coalition constituent members a formidable budget of some $300,000; these dollars are to be raised by individual and corporate membership fees.

It is well, however, to echo sentiments expressed by Representative Jean Toal and Mr. Dwight Drake at the recent coalition meeting to form the advisory board. These learned individuals, who deal daily in legislative efforts, point out that money *alone* will achieve little or nothing. We have to have a "grassroots," personal contact program the likes of which has perhaps never been seen in South Carolina. Coalition constituents, including physicians, will be asked to contribute vigorously with their time, their influence, their friendship and dialogue with the legislators, as well as with our dollars.

I am satisfied physicians will answer this call, and will actively support the Civil Justice Coalition. Send in your $50, if you have not already done so. Stand ready when SCMA or other coalition members ask for support by letter, telephone call or personal call to our legislators. And most important, encourage your friends and patients that our effort is an effort to protect South Carolina citizens from the ravages of the liability lottery which currently exists.



— Walter J. Roberts, Jr., M.D., *President*

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THE JOURNAL
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THE ANTIGENS AND ANTIBODIES OF HEPATITIS B: A REVIEW*

WILLIAM M. LEE, M.D.**

INTRODUCTION

The discovery of the Australia Antigen by Dr. Baruch Blumberg in 1965,[1] inaugurated a new field of study involving the molecular biology of the virus which we now call hepatitis B. No other virus has come under such careful scrutiny or is more pertinent to the health and survival of millions around the world. It is estimated that there are 200 million carriers of the hepatitis B virus (HBV) worldwide. While hepatitis B is not endemic in the U. S., there are still an estimated one million carriers and approximately 200,000 new cases of acute hepatitis B reported annually; thus, hepatitis B remains an important health problem in the U. S. In addition, the strong suggestion that HBV is linked to the pathogenesis of hepatocellular carcinoma (HCC), the most common form of cancer worldwide, adds to the intense interest in this ubiquitous and complex agent.

The rapid increase in our knowledge of the structure of the hepatitis B virion has led to an increasingly intricate and changing understanding of the interaction of the virus with its human host. Every few years since the original characterization of the hepatitis B surface antigen (HBsAg) as synonymous with the causative agent of long-incubation or "serum" hepatitis, a new antigen system is described. These antigens are clearly associated with the virus, yet distinct from the original HBsAg, and add to our insight and understanding of viral structure and function. The process by which HBV lives in symbiosis with its human host causing, in different individuals, such a variety of outcomes is a complex one and there is still much to learn. The present review is intended to emphasize our current understanding of the array of HBV antigens (both old and new) and their relevance to the diagnosis and treatment of patients with HBV-related diseases.

OVERVIEW

The hepatitis B virus is now understood to be a member of the Hepadna virus group, a family of DNA-containing viruses with a predilection for the liver. Although HBV cannot be transmitted to species other than man and chimpanzees, very similar DNA viruses have been identified in woodchucks, ground squirrels and Pekin ducks. These viruses share a similar DNA core, surface antigen coat, DNA polymerase and so forth. The other Hepadna viruses provide ideal animal models for further study of both the pathogenesis of hepatitis as well as oncogenesis. While the other Hepadna viruses cannot be transmitted to man, they are similar enough to be identified in animal sera using the same radioimmunoassay kits employed for human HBV!

The hepatitis B virus is not thought to be cytopathic; that is, it does not damage liver cells in the conventional sense, but instead is capable of entering a cell and employing the cytoplasmic

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machinery to produce viral particles. In acute HBV infection, this process requires several weeks. A unique feature of hepatitis B virus is the vast quantity of viral material produced. As many as 10^{13} particles containing surface antigen and 10^{10} whole virions or Dane particles are found in each ml of serum from patients with acute hepatitis B. The presence of these foreign antigens in the circulation stimulates the immune system to mount a response over the next one to four weeks. Both cellular and humoral immune mechanisms are presumed to develop in healthy individuals,[2] and result in damage to virus-infected cells manifested as liver cell injury (cellular response) and subsequent clearance of particles released in the circulation (humoral response). By this hypothesis, the individual with less than optimal immune function, when exposed to HBV, is likely to become a chronic carrier since he fails to develop an adequate clearance process. Newborns, those receiving immunosuppressive therapy for other diseases (renal transplants, for example), and those with other immunodeficiencies are frequently incapable of normal clearance of the virus and thus become lifelong hosts for this tenacious vector.

At a certain point in the life cycle of HBV within the host, a stage is reached in which the entire viral DNA is no longer present in the hepatocyte, and fragments of DNA are incorporated into the host genome. This process results in the production of particles which are mainly surface components — whole virions are no longer produced. It is at this stage that the virus may remain dormant, surface particle production may even cease, and yet the virus' oncogenic potential can still be realized. In support of this concept, recent studies in alcoholic cirrhotics with HCC who lack evidence of prior exposure to HBV, have demonstrated portions of HBV DNA in tumor cells as evidence of the oncogenic potential of HBV.[3] This brief review of the pathogenetic processes involved in HBV infection will be supplemented by the discussion of the individual viral antigens and their significance for diagnosis and treatment of this unique infection.

HEPATITIS B SURFACE ANTIGEN (HBsAg)

Formerly called Au Ag or HAA, this antigen complex constitutes the main polypeptide of the coat of the 40 nm whole virions as well as the excess rods and small 20 nm spheres characteristic of HBV (Figure 1). The major component of

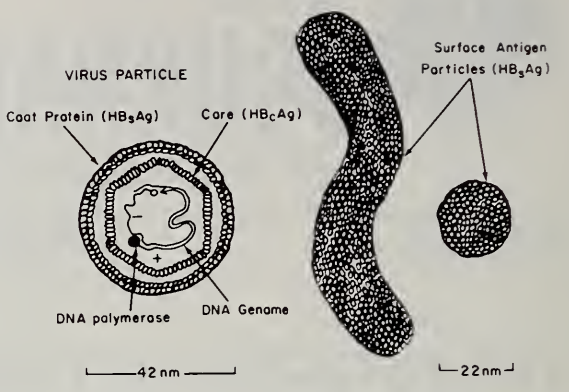


FIGURE 1. Virus particles associated with hepatitis B. Both infectious and noninfectious particles are produced by infected hepatocytes. Infectious (Dane) particles contain a small circular DNA genome, and a DNA polymerase. (From Summers J: Replication of hepatitis B viruses. In: Vyas GN, Dienstag JL, Hoofnagle JH, eds. Viral Hepatitis and Liver Disease. Orlando: Grune and Stratton, Inc. 1984:88. By permission of publisher.)

HBsAg is a polypeptide termed P 25, a 25 kilodalton protein consisting of 226 amino acids. The presence of HBsAg is synonymous with the HBV carrier state and with most cases of acute hepatitis B (AVH B) although subclinical cases without evidence of surface antigenemia probably occur. Clearance of HBsAg from serum is generally equivalent to resolution of AVH or of the carrier state. In AVH B, clearance of HBsAg usually occurs after several weeks but at roughly the same time as resolution of transaminase elevations (Figure 2). High transaminases in a patient without HBsAg present probably does not represent the subclinical infection referred to above, but rather infection by a different virus, since clinically evident hepatitis B is always associated with easily detectable HBsAg. The surface antigen is relatively immunogenic and antibody to HBsAg is protective against future infection. Thus, the hepatitis B vaccine, derived from carrier plasma from which the 20 nm small spherical particles have been separated and formalin treated, is a reasonable and safe immunizing agent since it contains HBsAg but does not contain any whole virions. Subtypes of HBsAg have been recognized (see below), but are mainly of use in epidemiologic studies of AVH B outbreaks and are not of clinical value.

ANTIBODY TO HEPATITIS B SURFACE ANTIGEN (Anti-HBs)

Antibody to HBsAg appears to be the principal

component in the protective immunity which develops from vaccine or virus, and has been used as hepatitis B immune globulin (HBIG) for short term passive immunization as well. Its characteristics are unlike other virus antibodies in that anti-HBs is present early in the prodromal period of AVH B in about 10 percent of patients (those with arthralgias and rashes) but, does not otherwise appear in serum until an interval of weeks to months after HBsAg has disappeared (Figure 2). The explanation for this so-called "window period," for the late appearance of antibody, and its relatively low titer compared to other antibodies remains unknown. Some patients never appear to have demonstrable anti-HBs but many of these are still capable of producing anti-HBs and appear protected when re-exposed at a later time. All anti-HBs species include antibody to the common surface determinant "a" but also include specificities of one or another mutually exclusive subtype, noted by the letters d or y and w or r. Thus, a specific type of antibody (or antigen) might be classified as adw or ayr. Though of little significance generally, differences in subtypes appear to explain the simultaneous presence in serum of HBsAg and anti-HBs, since the antibody in these instances represents a different subtype from that of the HBsAg itself, suggesting that two separate HBV infections with different outcomes have occurred. Infusions of antibody to HBs do not abolish the carrier state where it is already in place, but i.m. injections of anti-HBs as HBIG, prepared from high titer donors, appear at least partially effective in protecting against infection if given in close proximity to parenteral exposure. This has been of particular value in prevention of vertical transmission, i.e. infection of newborns by carrier mothers. In this setting, the prevalence of transmission of HBV is as high as 90 percent but drops to virtually nil if HBIG is given in the perinatal period.

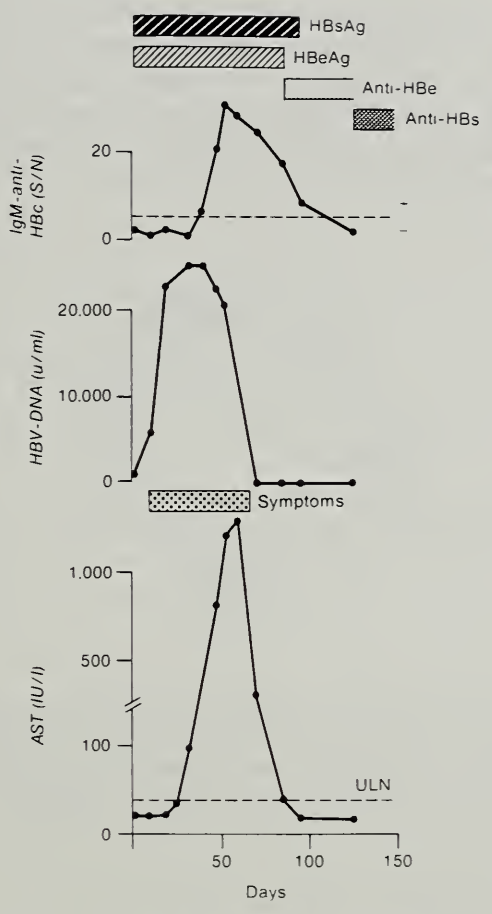


FIGURE 2. Sequence of events in acute hepatitis B. HBsAg, HBeAg and HBV-DNA are present in serum for several weeks before there is evidence of hepatitis, i.e., elevated AST. The hepatitis occurs as the host mounts an immune response and IgM anti-HBc appears. (From: Thomas HC, Pignatelli M, Goodall A, et. al. Immunologic mechanisms of cell lysis in hepatitis B virus infection. In: Vyas GN, Dienstag JL, Hoofnagle JH, eds. Viral Hepatitis and Liver Disease. Orlando: Grune and Stratton, Inc. 1984:169. By permission of publisher.)

HEPATITIS B CORE ANTIGEN (HBcAg)

Digestion of the whole HBV virion or Dane particle with detergent led Almeida in 1971 to discover the antigenic component of the virus referred to as "core" antigen or HBcAg. This constitutes the inner structure of the virus and cannot be detected in serum unless detergent methods to break down virions are used. It is also present in infected liver cell nuclei. The main structural element of HBcAg is a 19 kilodalton polypeptide which is heavily phosphorylated. Phosphorylation suggests the presence of protein kinase activity typically found in other virus cores but this enzyme has not been conclusively demonstrated for HBV. HBcAg is distinct antigenically from HBV DNA and DNA polymerase, but closely resembles hepatitis B e antigen (HBeAg) and currently both the core and the "e" antigen are thought to be coded for by the same region of the HBV DNA structure (Figure 3). While HBcAg is located primarily in the hepatocyte nucleus, it has been suggested that this antigen is also displayed on the cell surface; this is likely since anti-HBc would not be apt to develop in serum if HBcAg were only intracellular in location. Immune responses of T-cells directed against

the infected hepatocytes may therefore be directed at HBcAg and these responses could be further modulated by anti-HBc as suggested by Eddleston and colleagues.[4] The precise role of HBcAg in the immune response mechanism directed against HBV remains unclear.

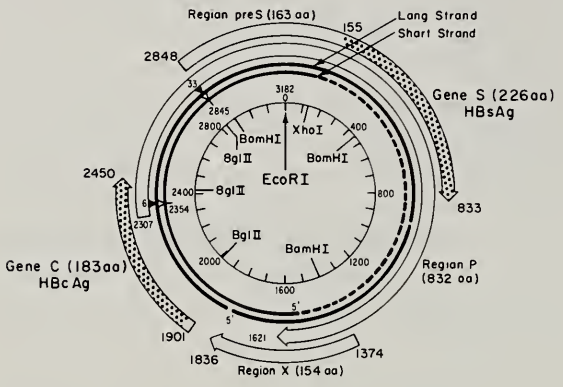


FIGURE 3. Diagram of HBV genome, illustrating the organization and arrangement of coding sequences for specific viral genes. (From: Lieberman HM, Shafritz DA. Molecular biology and pathophysology of hepatitis B virus infection. Viewpoints on Dig Dis. 1984; 16:14. By permission.)

ANTIBODY TO HEPATITIS B CORE (Anti-HBc)

Antibody to the core antigen, unlike anti-HBs, appears early in the course of AVH B in virtually all patients and is long-lasting. Thus, it provides evidence of recent or past infection for both the recovered patient and the carrier as well. Since it is uniformly present in carriers, anti-HBc does not appear to confer any protective immunity. As with most viral infections, the initial antibody response is of the IgM class followed by the longer lasting IgG response. Detection of IgM anti-HBc has been shown to be the earliest form seen, and declines rapidly in most but not all with AVH B, occasionally persisting for months or years. Thus, the presence of IgM anti-HBc has been recommended as a useful test for recent infection but this is not invariably the case. Additionally, many with chronic hepatitis B can be shown to have IgM anti-HBc, albeit at lower titers than those with acute infection.[5] Because anti-HBc is present in virtually all with HBV exposure regardless of outcome, it has little clinical utility in day-to-day practice. It has, however, been of use in screening individuals prior to receipt of vaccine, since any evidence of prior exposure precludes the need for vaccination, regardless of the HBsAg status. Whether IgM anti-HBc will be of clinical value remains to be seen.

HEPATITIS B e ANTIGEN (HBeAg)

Another antigen system of considerable importance was described initially in 1972 by Magnius and Espmark: the e antigen appears as a soluble protein viral product present in serum but not a part of other viral structures. HBeAg appears in serum in association with active HBV replication, and disappears in conjunction with the loss of whole virions as well as other signs of replication such as DNA polymerase. Studies of the specificities of HBeAg suggest that there are several subtypes in this antigen system, capable of reacting with antibodies which develop later in the course of clinical disease, whether acute or chronic hepatitis B. As mentioned previously, HBeAg is closely related to the core antigen and may be a precursor or building block for the HBcAg structure. Hepatitis B e antigen is important in two regards. First, it is a marker of infectivity because of its association with active virus replication, and second, its disappearance heralds the phase of viral integration into the host genome. These two phases have been termed replicative and non-replicative by Hoofnagle.[6] With loss of HBeAg, anti-HBe appears in most individuals. Spontaneous conversion to HBeAg negative state and anti-HBe positivity occurs in five to ten percent of patients per year. For clinical purposes, HBeAg provides evidence of ongoing virus production and more active liver disease in most but not all instances. Detection of HBeAg in maternal serum virtually assures vertical transmission to the newborn, unless HBIG is given. The same cautions apply regarding needle sticks from HBeAg positive patients; however, the association of HBeAg with infectivity should not be overinterpreted. HBeAg negative sera are less infectious but may still transmit infection since only minute quantities of virions are necessary to produce disease. Thus, prudent clinical management would suggest that the same precautions for handling serum and needle stick exposures should be observed regardless of HBeAg status. On these grounds, information concerning HBeAg is frequently of interest to the clinician but is not essential for most management decisions.

DNA POLYMERASE (DNAP)

Presence of the enzyme DNA polymerase in

serum, like HBeAg, is a marker of viremia and infectivity, and correlates well with the presence of HBeAg and with high titers of HBsAg. The Hepadna group is the only known virus class to possess this enzyme although similar DNAP's are found in mammalian cells. This enzyme adds nucleotides to the shorter DNA "s" strand, thus forming the double stranded complementary DNA structure (Figure 3). The measurement of DNAP has been used in the characterization of those suitable for treatment with investigational drugs such as alpha-interferon, since patients with active viral replication might be more likely to respond to anti-viral treatment than those whose disease was at a more dormant stage. Typically, DNAP levels drop sharply with interferon therapy; however, virus eradication has been less successful than hoped although it does appear to occur with treatment at a rate slightly higher than that expected due to spontaneous conversion alone.[7] Measurement of DNAP is only performed in research facilities at the present time and is unlikely to become routinely available.

HEPATITIS B VIRAL DNA (HBV DNA)

Using molecular hybridization techniques, it is now possible to detect free HBV DNA in serum and in tissue samples. This is another sensitive marker of active viral replication, and correlates well with presence of HBeAg and DNA polymerase activity in serum. The entire HBV genome has been characterized and mapped and consists of 3200 base pairs (Figure 3). Of interest, these hybridization techniques have allowed identification of the two stages referred to earlier, the replicative stage, in which free DNA is present in hepatocyte cytoplasm (and in certain other cell types as well) and the non-replicative stage where portions of the HBV genome is incorporated in the host chromosomal material. These techniques led to the identification of HBV DNA sequences in tumor tissue of both HBsAg-positive patients and HBsAg negative individuals with HCC, further implicating HBV as an oncogenic virus. In light of the more easily available HBeAg assay (which produces similar results), HBV DNA also remains a research tool not readily available to the clinician.

HEPATITIS DELTA VIRUS (HDV)

In 1977 Rizzetto described yet another antigen which was the marker of an infectious agent closely linked to HBV infection, the delta or HDV agent.[8] The HDV agent is a 36 nm particle composed of HBsAg and a unique delta antigen (HDAg) surrounding an RNA core. The delta antigen was first detected in the nuclei of HBsAg carriers and was thought initially to be another component of the core antigen system. However, studies in Italian carriers and later in patients from other parts of the world revealed that this was a unique "passenger" virus, incapable of replication in the absence of HBV. Detection of HDV infection depends on immunohistological identification of HDAg in liver (using suitable antisera for fluorescent study), or the simpler detection of IgG or IgM antibody (anti-HD) in sera of patients with ongoing infection. HDAg is a protein of MW 68,000 and is only identified in serum when produced in massive amounts in fulminant infections. HDV, unlike HBV, is thought to be directly cytopathic to liver cells. Of interest, delta infection is associated with a suppression of HBV DNA production and a decrease in the quantity of other HBV gene products in serum, but not with HBV eradication.

Clinically, HDV infection most commonly yields an acute hepatitis in the previously asymptomatic HBV carrier. The illness is often severe but otherwise indistinguishable from AVH B. Unless IgM anti-HBc is found to be absent, the logical assumption would be that the infection was due to HBV. Co-infection with both HBV and HDV simultaneously may occur but is less apt to produce full-blown disease presumably due to lack of sufficient HBsAg present at onset to allow the second virus to take hold. Epidemic fulminant hepatitis also has been attributed to HDV infection in third world areas where HBsAg carrier rates may approach 60 percent and spread by skin infection, sexual contact or tattooing aids the rapid spread of infection. Finally, delta infection is also thought responsible for a more rapid progression to cirrhosis in the patient with chronic hepatitis B. A serologic test for anti-HD (radioimmunoassay) will soon be available. Whether this will gain general acceptance remains to be seen since, like HBeAg testing, knowledge of HDV status may have prognostic import but little effect on therapy at this point in time.

POLYMERIZED HUMAN SERUM ALBUMIN (pHSA)

Another antigen-antibody system described

initially in 1974 but more recently of note is that associated with polymerized albumin. Native albumin in serum is thought to polymerize as it ages and to be removed from serum by specific receptors on the hepatocyte surface which recognize the polymeric form. Sera from patients with various forms of liver disease were noted to have binding activity for polymers of albumin (these can be formed synthetically by treatment with glutaraldehyde) and this was initially presumed to be due to antibodies to pHSA. However, a strong association of this pHSA binding activity with HBsAg positive sera led to the suggestion that HBV itself might bind pHSA. Indeed, a receptor specific for pHSA has been identified predominantly in sera of HBeAg positive individuals. Thus, the pHSA receptor is presumed to be present primarily on whole hepatitis B virions (Figure 4). It has been proposed on these grounds that pHSA may provide the link between virus and hepatocyte which allows entry of HBV when pHSA is ingested by the cell.[9] This would explain the hepatotropism of HBV infection as well as the virus' species limitations, since the receptor for pHSA on HBV appears to recognize only human and chimpanzee albumin polymers. Antibodies to pHSA are present in the sera of patients with AVH B and fulminant hepatitis B (as well as those with hepatitis A, chronic hepatitis not due to HBV infection and primary biliary cirrhosis) but such antibodies are notably absent from the sera of all chronic HBsAg carriers including those with active liver disease. Recent studies suggest that anti-pHSA are most evident in the sera of those with a brisk immune response, characterized by high transaminase levels, early clearance of HBeAg and shorter duration of illness.[10] Such patients are primarily but not exclusively women and it is noteworthy that women also have a considerably lower rate of chronic infection following AVH B. These data suggest that anti-pHSA play a role in the viral clearance process by interference with the pHSA linkage mechanism already described.

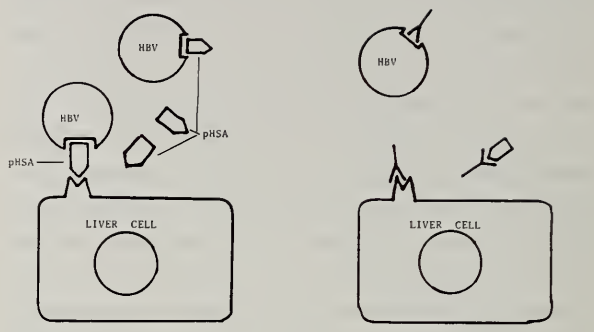


FIGURE 4. Proposed mechanism of HBV interactions with pHSA.

a. HBV attaches to liver cell prior to cell entry via pHSA linkage as suggested by Imai.[9] Receptors for pHSA are present on the hepatocyte as well as HBV.

b. Antibodies to HBV pHSA receptor, to pHSA itself or to the liver cell receptor for pHSA would each be expected to interfere with virus attachment and cell infection.

ANTI-pHSA RECEPTOR ANTIBODY

To further complicate matters, Alberti described in 1984 an anti-Dane particle antibody which appears to be directed against the pHSA receptor on HBV.[11] Hypothethically, this antibody is also capable, like anti-pHSA, of interfering with viral spread by blocking attachment of pHSA to HBV, and thus, may also be important in viral clearance (Figure 4). The receptor itself is now well characterized: it is composed of a 32 kilodalton polypeptide (P-32) which is coded by the pre-S region of the HBV genome (Figure 3). Thus far, there is no clinical utility to a knowledge of one's anti-pHSA or anti-pHSA receptor status and these tests are not generally available. Presence of anti-pHSA predicts a prompt recovery from hepatitis B infection but its absence does not preclude a successful outcome. The roles of anti-pHSA, antibody to the pHSA HBV receptor or even antibody to the cellular receptor for pHSA require further delineation before they gain general acceptance as full-fledged members of the already complex HBV antigen system.

THE FUTURE

One further region of the HBV-DNA genome, region X, (Figure 3) remained unaccounted for until a recent report[12] of the expression of the gene product of region X using recombinant virus technology. Two peptides have been synthesized using region X as template, and these peptides were subsequently identified in HBV-infected tissues. Antibodies to the peptides were also detected in sera from patients with HBV-positive hepatitis and HCC. The significance of these peptides is

unclear but they presumably represent the final antigens to be discovered in the HBsAg system!

Attention has recently shifted to identification of the intermediate DNA (and RNA) species involved in the actual process of HBV replication within the cell. HBV, though a DNA virus, replicates its DNA using an RNA precursor in a manner which resembles in certain respects the RNA-containing retroviruses such as the HTLV-III agent (the putative Acquired Immunodeficiency Syndrome Virus). Molecular hybridization techniques in the next few years will probably lead to development of a further nomenclature surrounding the DNA intermediate forms,[13] as the never-ending chain of HBV-related discoveries continues. □

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AN ALTERNATIVE METHOD FOR DISTAL EXTREMITY BYPASS WITH A SHORT GREATER SAPHENOUS VEIN*

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Since Kunlin published his report in France in 1951, reversed autogenous vein, usually saphenous, has been the standard for bypass grafting in lower extremity arterial occlusive disease. In the 20 to 30 percent of patients with unavailable or inadequate vein for bypass use, the choice of an alternative is unsettled. In the search for an alternative conduit for lower extremity vascular reconstruction, surgeons have tried arterial homografts, Dacron, PTFE, umbilical veins, Mandril grafts, superficial femoral endarterectomy, cephalic veins, and various composite and sequential grafts.

A current popular alternative is the use of expanded polytetrafluoroethylene (PTFE). Bergan et al demonstrated, by a randomized study, no statistical difference in patency between PTFE and reverse saphenous vein grafts in the suprageniculate position at 20 months follow-up. Reverse saphenous vein grafts (RSVG) were significantly better in the infra-geniculate position and superior in the distal artery bypasses.[1] In commenting on this presentation in Boston, Dr. Szyilagyi stated "... the autogenous vein graft is still the best substitute in all positions and it is the only one to use in the infrapopliteal (or distal) lesions that must be corrected."

The work of Gonza, Clarke, Abbott and their associates, proposes a mismatch of compliance between the graft and arterial interface as a significant factor for thrombosis and anastomotic stricture. Lack of compliance interferes with pulsatile flow, predisposing to turbulent flow and hemodynamic trauma. Abbott and Bonchier-Hayes, while measuring compliance in canine arteries, have found 100 percent patency of arterial autografts.

With this in mind, the idea as proposed by DeLaurentis of using an endarterectomized segment of autogenous artery for a composite sequential graft is attractive. DeLaurentis and Friedmann first reported this alternative method for distal reconstruction of the lower extremity in 1971 (Figure 1). The distal prosthetic graft anastomosis and the proximal vein anastomosis are sutured into a patent or endarterectomized segment of the supra-geniculate popliteal artery. The distal vein is anastomosed to the infra-geniculate popliteal or appropriate tibial vessel. Modifications of this technique were later performed. An autogenous vein-arterial interface at the distal anastomosis allows for a decreased compliance mismatch, and although the PTFE-arterial anastomoses have compliance mismatches, they occur at a site of a larger diameter tube which better accommodates the problem with less impedance to flow.

Our limited experience in five patients with the composite sequential graft for limb salvage is presented, and the results of others with this method are reviewed. A brief discussion of the considerations in distal extremity bypass procedures is given.

CASE ONE

A 55-year-old, male security guard, a two pack per day smoker, was the first candidate for a composite sequential graft. He had a history of CABG and an above-knee, PTFE, right femoral-popliteal bypass graft for incapacitating claudication, both performed in 1982. Graft thrombectomy was performed within 24 hours post-extremity bypass and Warfarin was necessary to

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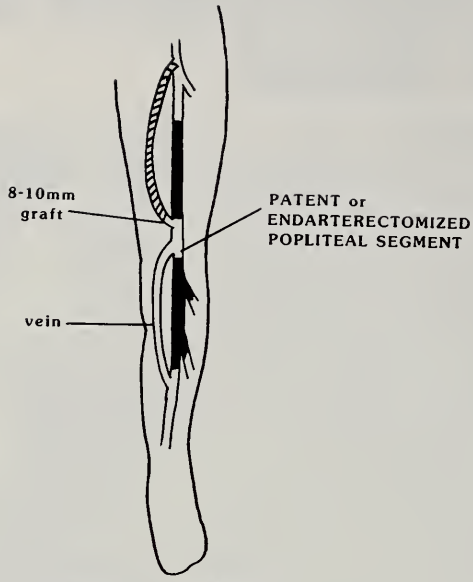


Figure 1. De LAURENTIS

maintain graft flow. Pertinent past history was a severe fracture of the right ankle in 1973 with loss of pulses.

Admission was necessary in January, 1983 due to a bleeding peptic ulcer; the Warfarin was discontinued, and the graft clotted. Subsequently rest-pain developed post hospitalization. He was readmitted in April, 1983 with impending limb loss of the right foot. Intra-operative arteriography revealed arborization of the circulation beyond the popliteal artery. From the new PTFE femoral-popliteal graft a sequential RSVG to the mid-posterior tibial artery and tibial vein fistula was placed. Thirty-three months later this graft is still functioning.

CASE TWO

A 70-year-old female with diabetes controlled by diet and a history of tobacco use for "many years" presented with severe nocturnal rest-pain of the left forefoot. A myocardial infarction delayed treatment for five months but the rest-pain became so severe she was hospitalized before six months had passed. Arteriography demonstrated occlusion from the left superficial femoral artery to the posterior tibial vessel, and profunda femoris stenosis. At surgery in February, 1984, the saphenous vein proved of inadequate length. After a profundoplasty, a femoral-popliteal graft of 8mm PTFE was anastomosed to an endarterectomized supra-geniculate popliteal artery segment. The RSVG connected this segment to the posterior tibial artery. This graft is still functioning 23 months later.

CASE THREE

A 78-year-old female former cigarette smoker presented in February, 1985 with nocturnal rest-pain of the right forefoot of several weeks' duration, and a non-healing ulceration. Arteriography demonstrated an occluded right superficial femoral artery with reconstitution of the proximal popliteal artery only. No trifurcation was identified, but a peroneal vessel was seen to the ankle and reconstituted the anterior tibial artery.

Because of an insufficient length of saphenous vein, a DeLaurentis bypass of PTFE from the right femoral artery to the endarterectomized segment of proximal popliteal artery, and a RSVG from the popliteal to the peroneal arteries were used for the reconstruction. Although claudication is still present, the graft is functioning eleven months later and limb salvage obtained.

CASE FOUR

A 46-year-old hypertensive female, a pack a day cigarette smoker, had been seen at age 43 for severe claudication of both lower extremities, the left greater than right. The non-invasive testing showed an ankle-brachial index of 0.5 on the right and 0.44 on the left. She did not desire surgery, and agreed to stop smoking, alter her diet, and follow an exercise program.

She returned two and one-half years later with nocturnal toe numbness, 4+ rubor, 4+ elevation palor, a 5-second capillary filling time, and greater than 45 second venous filling time in both lower extremities. Ankle-brachial indexes were — right 0.21, left 0.0. Angiography revealed severe bilateral aorta-iliac disease with extensive collateralization to the common femoral arteries and bilateral superficial femoral artery occlusions. She agreed to surgery and an aortobifemoral bypass and right profundoplasty were performed in December, 1984. Subsequently, with no relief of rest-pain, a right aortic-femoral limb thrombectomy and a supra-geniculate-femoral-popliteal PTFE graft were successful in January, 1985.

Rest-pain recurred in the left foot, and in March of 1985, thrombectomy of the left aortic-femoral graft limb, and a composite sequential bypass to the distal popliteal artery were per-

formed. An incomplete pedal arch was present, and the grafts subsequently thrombosed. Re-operation with thrombectomy and placement of a distal AV fistula did not solve the outflow problem and she re-thrombosed. Currently, she has a healed left above-knee amputation.

CASE FIVE

A 58-year-old male, one year status-post coronary artery bypass, gave a history of bilateral calf claudication of two years duration. He presented with left forefoot nocturnal rest-pain of five weeks duration, a fungal infection of the toe webs, and cellulitis of the same foot. Angiography identified bilateral aorto-iliac occlusive disease, the left greater than right, complete occlusion of the left superficial femoral artery, and reconstitution of a blind proximal popliteal artery segment with a single vessel runoff.

In January, 1985, a thromboendarterectomy of the left common/external iliac arteries with patch angioplasty and a DeLaurentis femoropoplitealtibial bypass were performed. The proximal popliteal segment did require endarterectomy. Postoperatively the patient was without pain upon ambulation. He continued to do well until three months later, when he returned with left foot pain of four days duration, the onset occurring while fishing. Angiography demonstrated occlusion of all vessels at mid-calf. At surgery thrombectomy of the grafts and distal vessels was possible, and though endarterectomy/patch angioplasty were performed at the tibio-peroneal trunk, flow could not be maintained. After the third thrombectomy at the same operation, the incisions were closed. The patient now has a healed left above-knee amputation.

DISCUSSION

The terminology of "sequential" and "composite" bypass grafts is confusing as currently used in the literature. Sequential may refer to a single graft of vein or prosthesis which has an intermediate anastomosis to an isolated popliteal segment and then distally to a tibial artery, or to those grafts having more than one anastomosis to the tibial vessels. Composite refers to grafts composed of prosthetic and autogenous vein generally constructed in an end-to-end, or end-to-side fashion. The DeLaurentis femoropoplitealtibial bypass is a composite graft anastomosed in a sequential manner (Figure 1). Perhaps the term "composite sequential graft" as coined by Verta is more appropriate.

DeLaurentis first performed the operation when faced with the need for an infrageniculate bypass in a patient with an inadequate length of saphenous vein. The operation avoided the technical problems of end-to-end composite grafts, and allowed use of a proximal segment of popliteal artery which was endarterectomized if necessary. The proximal graft was initially knitted Dacron, but PTFE was subsequently used with similar results. Further experience with this technique in 28 limbs yielded a gross patency rate of 71 percent. Five immediate and three late failures occurred over the follow-up period of four months to five years.[2]

The ten year report by DeLaurentis of 33 composite sequential femoropopliteal grafts and 22 composite sequential femoropoplitealtibial grafts yielded a cumulative patency rate at 60 months of 42 percent.[3] The number of proximal popliteal artery endarterectomies performed or the number of partial graft failures were not stated. The serial reports by DeLaurentis et al are summarized in Table 1.

The advantages of this technique are: (1) its use as a planned or alternative procedure; (2) allowance of excellent inflow by the larger prosthetic lumen; (3) utilization of the best segment of saphenous vein to cross the knee joint; (4) the proximal saphenous vein fixation to the popliteal artery prevents angulation or twisting of the distal vein; (5) the disparity of lumen size and compliance at the distal tibial anastomosis is lessened by use of RSVG; and (6) similar disparity of the prosthesis, popliteal artery, and saphenous vein at the intermediate anastomoses are lessened, while allowing the theoretical advantage of compliance mismatches to occur in a larger vessel where the highest flow rates occur.[4, 5] Potential disadvantages of the technique are the additional operative time and vascular anastomosis, and the risks of prosthetic graft infection. The fate of the endarterectomized popliteal segment is not truly known, however, segmental patency has been demonstrated by angiography, and late occlusions of the intermediate anastomosis from intimal hyperplasia have not been significant.[3]

Bliss and Fonseka reported their experience with 16 similar procedures.[4] A variation of the intermediate anastomosis allowed the prosthetic

Table 1. RESULTS WITH COMPOSITE SEQUENTIAL FEMOROPOPLITEALTIBIAL BYPASS GRAFTS-
De Laurentis et al

YEAR	NUMBER OF GRAFTS	MOST DISTAL ANASTOMOSIS	FOLLOW-UP	CUMULATIVE PATENCY
1972	5	4 popliteal 1 tibial	longest at 16 mos.	100%
1976	28	15 popliteal 13 tibial	longest at 66 mos. (4-66 mos.)	71%
1981	55	33 popliteal 22 tibial	longest at 105 mos. (3-72 mos.)	42%

and venous anastomoses to be performed into a single arteriotomy in an endarterectomized segment of proximal popliteal artery. This was described as a "hitch-hike" graft. Distally, the anastomoses were equally to the distal popliteal and tibial arteries. Eleven grafts were functioning at two to 14 months. There were two early and two late graft failures. One patient with a functioning graft died on the ninth post-operative day from a myocardial infarction.

Another variation of the DeLaurentis technique for distal tibial bypass was described by Verta and coined the composite sequential graft.[6] It consisted of a 6mm PTFE utilized as the proximal graft to a patent supra/infrageniculate popliteal artery. A RSVG was anastomosed proximally to the side of the PTFE and distally to an appropriate tibial or pedal vessel (Figure 2). Thus, a bifurcated composite graft was created. The mechanical differences of compliance and size disparity of the vein and PTFE are lessened by the end-to-side anastomosis. Fifty-three patients were operated for limb salvage and followed from four to 48 months (mean 26.4). Graft thrombectomy within 24 hours of surgery was required and successfully performed in nine patients (17 percent) who were not considered graft failures. Patency at 24 months was 81.4 percent. Two patients with distal graft occlusions were spared amputation by patency of the proximal graft; an advantage of the operation also recognized in other series.[7, 8]

Femoral-tibial bypass grafts for limb salvage in extensive distal disease are not universally accepted as the operations of choice. Mannick demonstrated that RSVG into isolated popliteal segments in 17 patients and single distal tibial RSVG in 38 patients offered 94 percent and 73 percent one year patency respectively.[9] At four years the success rate was 70 percent for isolated popliteal segment grafts, and 63 percent for tibial vessel grafts. Mannick advocated grafting to an isolated popliteal segment over distal tibial grafts because of the technical ease of the former and the similar results at four years.

However, by utilization of more than one outflow tract in distal popliteal and tibial grafts, several investigators have shown better results with sequential grafting. Composite sequential

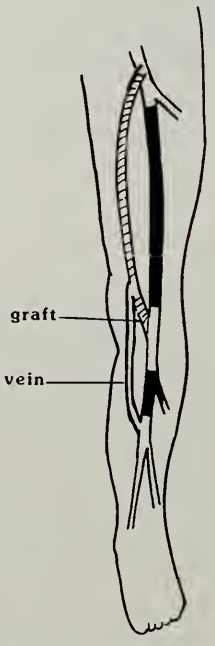


Figure 2. COMPOSITE SEQUENTIAL GRAFT

grafts offered results almost as good as pure vein sequential grafts in the series reports by Flinn et al.[6, 7, 8] Forty sequential femoropoplitealtibial grafts were performed with a follow-up period of three to 18 months. Eight of the nine composite sequential grafts remained patent. All three sequential RSVG remained patent. In 28 PTFE sequential grafts, the patency rate was 43 percent, with distal graft failure occurring in 12 patients and patency of the proximal graft preventing amputation in eight instances.

The more recent series by Flinn and associates compared the results of RSVG, composite grafts, and PTFE used in a sequential fashion. Patency rates at one and two years were 90 percent for RSVG and 98 percent/80 percent for composite sequential grafts. The PTFE sequential grafts had a patency rate of 52 percent and 47 percent at one and two years respectively. Similar results have been reported by Jarret and Burdick in the use of RSVG and composite sequential grafts for limb salvage.[10] The series results with the composite sequential bypass grafts are summarized in Table 2.

Though the vascular conduit utilized is of utmost importance, many factors determine the success of infrageniculate popliteal and tibial bypass grafts. Adequate outflow or distal runoff is an essential factor in successful extended bypass grafts. Dardik has called the integrity of the pedal arch as "among the most critical factors." However, detailed preoperative arteriography of the foot vessels is often inadequate with the arteries of the foot seldom demonstrated in the patient with multi-level arterial disease. Intraoperative angiography is essential to evaluate the foot arterial anatomy. The primary pedal arch is formed as the deep plantar branch of the dorsalis pedis artery communicates with the plantar metatarsal artery of the fifth digit and the lateral plantar artery branch of the posterior tibial artery. The secondary arch is defined as three major collateral networks of the dorsalis pedis and posterior tibial arteries, specifically the medial plantar to medial tarsal, the lateral tarsal to lateral plantar, and the arcuate to lateral plantar arteries. Formation of the primary or secondary arch from the peroneal artery via the anterior and posterior perforating branches can satisfactorily perfuse the foot and toes.

Bergan and Yao at Northwestern University reported an 87.5 percent early graft patency in distal tibial bypasses with a patent primary or secondary pedal arch, and a 12.5 percent success rate when no arch was present.[10] Dardik has suggested the creation of an arteriovenous fistula at the distal anastomotic site to maintain patency in the patient with a deficient arch, since high velocity flow to a high resistance area will result in poor volume flow and thus result in thrombosis.

Another factor hypothesized for graft failure is compliance mismatch. This has generally been described as the difference in mechanical properties between graft and artery as measured separately. Klein et al have recently demonstrated that an anastomotic suture line can itself change compliance. Hasson and associates have since demonstrated a para-anastomotic hypercompliance zone in the recipient artery. This zone of increased cyclic stretch is additive to any mechanical mismatch present between graft and artery, and it appears this is the same area shown by Hagan et al

Table 2. SERIES RESULTS WITH COMPOSITE SEQUENTIAL FEMOROPOPLITEAL BYPASS GRAFTS

YEAR	AUTHORS	NUMBER OF GRAFTS	MOST DISTAL ANASTOMOSIS	FOLLOW-UP PERIOD	CUMULATIVE PATENCY
1976	Bliss & Fonseka	16	8 popliteal 8 tibial	2-14 mos.	68%
1980	Flinn et al	9	all tibial	3-18 mos.	88%
1984	Flinn et al	30	all tibial	2-27 mos.	80%
1984	Verta	54	31 tibial 23 pedal	4-48 mos. (mean 26.4)	81%

to be the location of maximal subintimal hyperplasia. Additional study is necessary to clarify the problem of compliance mismatch and to develop methods of prevention. Theoretically, the composite sequential method of vascular reconstruction will minimize these mechanical factors that initiate failure of distal bypass grafts.

An additional factor for consideration is the short life expectancy of patients who need revascularization for foot ischemia. DeWeese and Rob reported an overall five year mortality rate of 48 percent, but 76 percent for patients presenting with gangrene. Stoney reported an overall 30 percent five year mortality rate but only 26 percent were alive with a patent graft and viable extremity at the end of one year. This substantial mortality rate is from underlying cardiovascular disease. Patients with limb salvage disease are in the end stage of extremity atherosclerosis and apparently near the end stage of systemic atherosclerosis.

SUMMARY

Patients with end stage atherosclerosis of the extremities present a significant challenge to the vascular surgeon. Frequently, autogenous vein has been used in previous cardiac/extremity vascularization procedures or is unusable; the composite sequential graft for distal extremity bypass is an excellent alternative for limb salvage in these patients. Our limited experience and that of others is presented with the hopes of making the management of these difficult patients more successful. □

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AORTOCAVAL FISTULA REPRESENTING A CONTAINED RUPTURE OF ABDOMINAL AORTIC ANEURYSM: CASE REPORT*

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Aortocaval fistula was first recognized by Syme in 1831,[1] but the first successful surgical repair of this entity is credited to Cooley in 1955.[2] The patients characteristically have signs and symptoms related both to rupture (shock, oliguria, pain) and to the central arterial venous fistula (bruit, high output congestive failure, wide pulse pressure with distal venous hypertension). Frequently, however, a fistula is not suspected preoperatively as hemodynamic alterations may be subtle or unrecognized. In any event, the recorded incidence is one to four percent of ruptured abdominal aortic aneurysms, and less than 100 cases have been documented in the world literature.[3]

Recognition must lead to immediate surgical intervention with proper hemodynamic monitoring as mortality in the untreated patient is rapid and inexorable.[4]

CASE REPORT

This patient is a 70-year-old white male who was seen with a two-day history of palpitations, diaphoresis, and progressive fatigue with shortness of breath. Review of systems revealed hypertension and diabetes. Physical examination showed a thin, well-nourished, elderly man with blood pressures of 120/40 in the right upper extremity and 135/40 in the left upper extremity. Pulse was 132. The neck revealed no bruits. Chest examination revealed fine crackling rales and auscultation of the heart disclosed a grade II/VI systolic ejection murmur without a diastolic component. Pulses were distinctly palpable with a water-hammer like quality to the posterior tibial and radial arteries bilaterally. The abdomen contained a large pulsatile abdominal aortic aneurysm with deviation to the right. A bruit was audible faintly over the hypochondrium. Extremities revealed no trophic changes and neurologic status was normal. Following admission to the hospital, laboratory evaluation showed an unremarkable electrocardiogram and a chest X-ray with pulmonary vascular congestion. The hematocrit was recorded at 30 percent and BUN/creatinine were recorded as 54 mg percent and 2.7 mg percent respectively. On abdominal ultrasound, the abdominal aortic aneurysm measured 10.5 centimeters. Echocardiogram showed normal cardiac wall motion. Thermal dilution cardiac outputs were measured at 15 liters per minute. An arterially injected digital subtraction angiogram demonstrated the aortocaval fistula and aneurysmal proximal iliac arteries (Fig. 1).

The patient was taken to the operating room and the abdomen was entered through a midline incision. Following slow cross clamping of the aorta there was immediate reduction of the tachycardia. The aneurysm was entered and finger control of the fistula obtained. An autotransfusion apparatus was available but was not needed. The fistula was closed with reinforced sutures and the aneurysm replaced with a bifurcated prosthesis. Hemodynamics and outputs normalized postoperatively. The patient convalesced uneventfully and was discharged on the ninth postoperative day with a clear chest X-ray and a BUN of 25 mg percent.

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FIGURE 1. Digital subtraction angiogram of aorta to vena cava fistula. (Arrows indicate vena caval fill during arterial phase.)

TABLE 1 SIGNS AND SYMPTOMS COMMONLY ENCOUNTERED IN AORTOCAVAL FISTULA

LOCAL	Abdominal Pain
	Abdominal Bruit
	Abdominal Mass
REGIONAL	Oliguria
	Lower Extremity Edema and Cyanosis
	Rectal Bleeding
SYSTEMIC	Widened Pulse Pressure
	Shock
	Congestive Heart Failure

DISCUSSION

Although not present in our patient, the usual presenting symptom is abdominal pain. Nevertheless, this patient did demonstrate the sequelae of central or visceral arterial venous fistula, namely high output congestive failure, abdominal bruit, widened pulse pressure and compromised renal function. In some patients, arterialization of the venous system and compression of the vena cava by the large aneurysmal mass may show peripheral venous overload with cyanotic extremities, hematuria and hemorrhoids.[4] The diagnosis of aortocaval fistula is easily missed though the signs and symptoms may be characteristic (Table 1). Unfortunately, the clinical picture may vary and in particular the cardiac manifestations may be seen with any catastrophic aneurysm presentation.

Renal failure in these patients is of particular interest. Unlike the renal failure in patients with ruptured abdominal aortic aneurysm, it is associated with markedly elevated central venous pressure. It is thought that aldosteronism is thus manifested, complete with increased plasma volume and retention of sodium and water. There is a decrease in peripheral vascular resistance, decreased mean arterial pressure and therefore decreased renal and glomerular blood flow in the face of increased renal venous pressure. The difficulty in diagnosis may cause delay or error in preoperative planning. Because of the hemodynamic instability and for myocardial protection, a Swan Ganz monitoring line is important. Autotransfusion apparatus should be available, as for all ruptured abdominal aortic aneurysms. Intraoperatively, it is important to palpate the aneurysm and the vena cava to ascertain the characteristic thrill which is indicative of the fistulous connection. In fact, following cross clamping of the aorta, the thrill should disappear and the heart rate decrease (Branham's sign).[5] It may be advantageous to apply the clamp slowly to the aorta in order to avoid a sudden decrease of right heart venous return as a result of closure of the fistula. After opening the aneurysm, surgical repair of the fistula is performed from within the aneurysm. Dark venous blood is seen at the fistula opening and is easily controlled by digital pressure. Usually, debris from the aneurysmal contents probably does not represent a significant embolic threat when the fistulous connection can be immediately controlled by digital application. Another option would consist of threading an occlusive balloon catheter through the fistulous connection into the vena cava, then inflating the balloon with saline and snug up the balloon to obtain closure of the fistula in this manner. The fistula, in any event, can then be closed with reinforced sutures from within the aneurysm by passing a continuous or interrupted suture beneath the controlling finger. The aneurysm is then replaced in the usual manner with a synthetic graft.

SUMMARY

A case of abdominal aortic aneurysm to vena

cava fistula is reported to demonstrate the clinical presentation of this unusual entity which includes a pulsatile abdominal mass with high output congestive heart failure. Following ascertaining of the diagnosis, immediate repair is recommended because of the universally fatal outcome in untreated cases. The closure of the fistula and repair of the aneurysm results in resolution of congestive heart failure and renal insufficiency and offers the patient long-term survival. □

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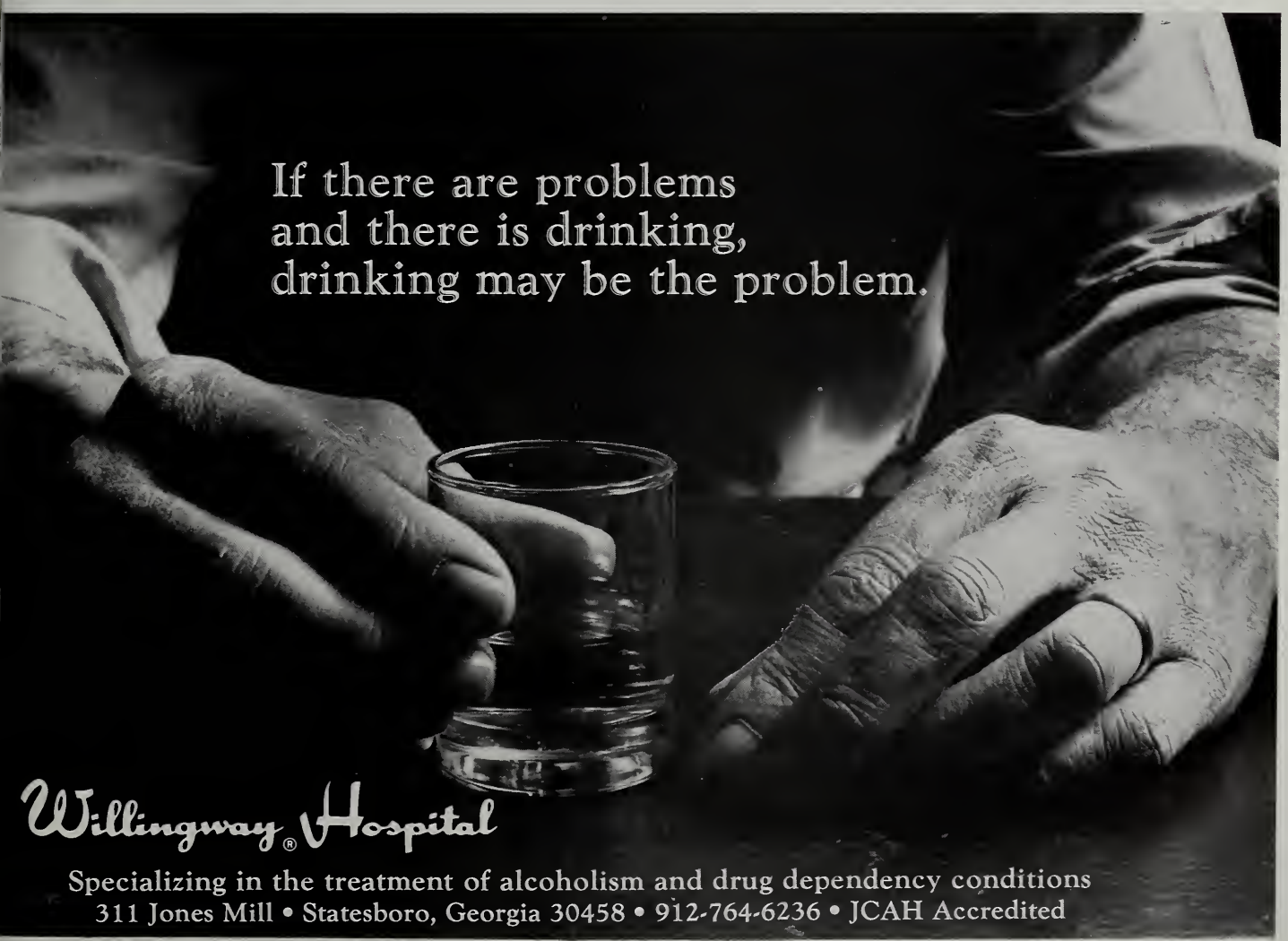
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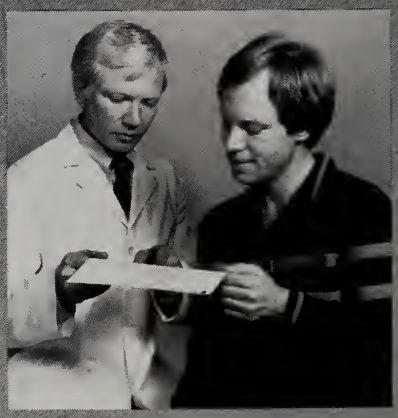
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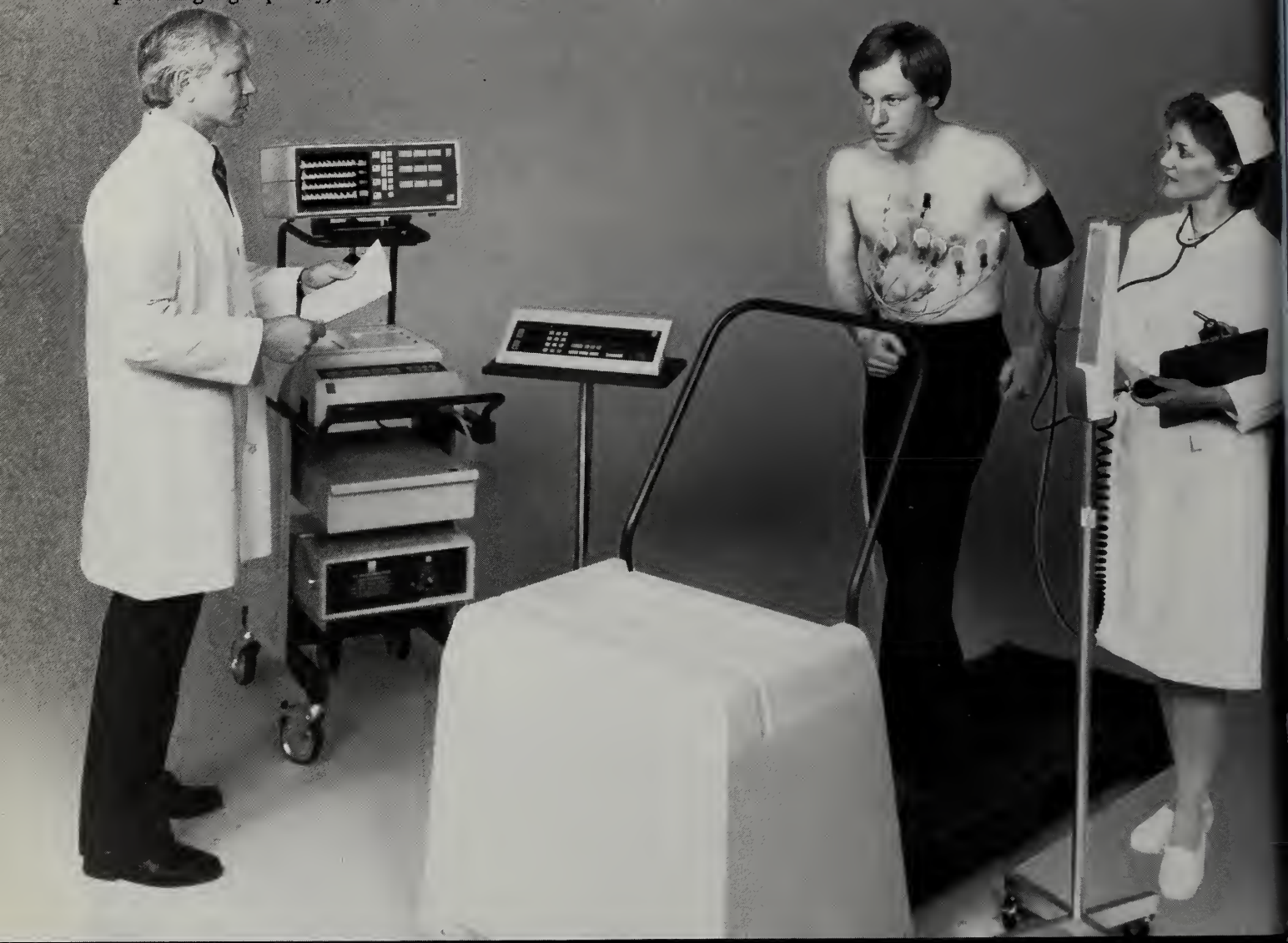
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SCMA NEWSLETTER

October, 1986

MEDICARE PARTICIPATION

Physicians will be given an opportunity to change their 1987 participating status from November 1 through December 15, 1986. At the time this newsletter went to press, the carrier expected to mail all physicians a letter offering them the opportunity to change their status; however, it is expected that no action will be needed for physicians to maintain current status.

SECOND ANNUAL LEADERSHIP CONFERENCE

The Second Annual Leadership Conference held recently in Columbia was a glorious success with approximately 100 attendees. Mark you calendars now for the 1987 conference to be held in Columbia on Wednesday, September 16.

This year's conference commenced with a panel on tort reform. Senator John Courson of Richland County highlighted 1986's legislation.

We were privileged to have South Carolina's two gubernatorial candidates, Carroll A. Campbell, Jr. and Michael R. Daniel, speak on issues of tort reform and hazardous waste in our state.

Campbell stated, if elected governor, he will create a commission to study the problems of escalating insurance rates and propose legislation to rectify it. He believes all goals of tort reform should be aimed at decreasing premium costs. Campbell supports a cap on non-economic damages, punitive damages going to the state and altering the joint and several liability doctrine.

Daniel supports reducing the statute of limitations to 13 years as well as the requirement of a certificate of merit being attached to complaints. He supports a non-economic cap and collateral sources if a roll back in premiums is assured. He also supports structured payments in awards exceeding $500,000 in addition to allowing physicians to move from a claims-made policy to occurrence with no penalty. He believes the commissioner of insurance should be granted more authority to roll back premiums.

On the issue of toxic waste, Campbell wishes to form a waste compact to control South Carolina as being a "dumping ground." He supports offering incentives to our state's businesses to encourage other means of waste disposal. He favors closing the GSX disposal site in Pinewood.

Daniel, too, supports business incentives for alternate means of waste disposal and closing the GSX disposal site. He favors forming a compact with other southern states to control waste disposal. If governor, Daniel plans to

establish a hazardous waste board to make policy for DHEC and to select sites. He will challenge the constitutionality of the Interstate Commerce clause in regards to waste disposal.

Other topics of concern were organized medicine, Medicaid and health issues in the 1987-88 legislative session and media relations.

The participation of the many physicians and auxilians in attendance was greatly appreciated. We look forward to seeing you and your fellow leaders of county medical societies at our Third Annual Leadership Conference next autumn.

TORT COALITION

Act now! Your involvement is crucial to the success of South Carolina's Civil Justice Coalition.

SCCJC is a broad-based group of organizations representing thousands of individual business people, corporations, and professional practitioners, together striving for the common goal of tort reform in the 1987 Session of the General Assembly. The SCMA is a member of the SCCJC along with many other organizations, such as the S.C. and Greater Columbia Chambers of Commerce.

In order to bring the civil justice system into proper balance, we must achieve the following legislation:

(1) abolish or modify the "joint and several liability" doctrine, which allows parties only partially or remotely to blame for a loss to be forced to pay the entire award;

(2) abolish or modify the "collateral source" rule, which allows a plaintiff to collect the same damages twice;

(3) limit non-economic damages to $250,000;

(4) return all punitive damages to the state; and

(5) reduce the time limit for filing civil suits from six to 24 years to three years.

Help us today in this effort of putting balance back into our civil justice system by endorsing SCCJC's legislative goals. The SCMA encourages physicians to send a $50 contribution for individual membership to: South Carolina Civil Justice Coalition, P. O. Box 11441, Columbia, SC 29211. For more information, contact Bill Mahon, SCMA Executive Vice President, at 798-6207.

PHYSICIAN RESPONSIBLE FOR PREMATURE DISCHARGE OF PATIENT

The first state appellate court case addressing the premature discharge of a patient, in need of additional hospitalization, due to the third-party payor's refusal to extend hospitalization found the physician responsible.

In this particular case, Wickline v. State of California, the patient was readmitted to the hospital for treatment of a blood clot which developed after her discharge nine days prior. The patient's leg was subsequently amputated.

Though this case is a precedent in California only and is not necessarily binding on South Carolina's courts, it does represent the first case in which the dilemma facing hospitals and physicians has been ruled upon by an appellate court.

For more information on Wickline v. State of California, please watch for future issues of the "Risk Management" bulletin.

SOUTH CAROLINA PRO UPDATE

Physicians in this state are represented by SCMA at the South Carolina Hospital Association PRO Liaison Committee meetings.

In this capacity, the SCMA serves as a physician liaison with the PRO in South Carolina and, on a national level, with the AMA's PRO Monitoring Program.

SCMA Board Member, Edward Catalano, M.D. and Barbara Whittaker, SCMA Executive Director, are serving on the PRO Liaison Committee. Mrs. Whittaker will be glad to assist members with questions regarding the PRO.

MEDICAID HIGH RISK CHANNELING PROGRAM

The SCMA works closely with DHEC and the S.C. Health and Human Services Finance Commission to identify and address problems our members encounter with the High Risk Program. Please call or write Barbara Whittaker, SCMA Executive Director, if the SCMA can be of assistance to you in handling your concerns or suggestions with these agencies.

TWO NEW SCMA SECTIONS

The SCMA is pleased to announce the formation of a Young Physicians Section which will focus on the special needs of physicians who are under 40 years of age or have been in practice for less than five years.

Roger Gaddy, M.D. of Winnsboro, is elected Delegate and James M. Lindsey, M.D. of Conway, is elected Alternate Delegate. They will represent the SCMA at the first AMA Young Physicians meeting in December and will organize the SCMA section during the first year.

The initial meeting of the SCMA's other new section, the Hospital Medical Staff Section, will be held at the Sheraton Northwest Hotel at 4:00 p.m. on Wednesday, January 21, 1987.

All hospital chiefs of staff and administrators will be invited to attend this important organizational meeting which will include speakers with national recognition of their expertise in this area, discussions of current concerns of S.C. Medical Staff and dinner.

This section will provide a means for medical staffs of hospitals to address common problems and interests, such as credentialing, JCAH requirements and utilization review requirements.

AMA'S DRUG EVALUATION, SIXTH EDITION

AMA's Sixth Edition of Drug Evaluation is now available.

This new edition not only provides an evaluation and comparison of drugs within therapeutic and pharmacological categories, it also provides detailed information on actions, labeled and unlabeled uses, adverse relations and precautions, interactions, pharmacokinetics, and product availability and dosage guidelines.

DE-6 contains information on more than 1,900 prescription and non-prescription drugs, 70 new drugs, and over 100 new investigational agents and uses.

To order or obtain information, please call 1-800-621-8335.

FREE SERVICE INFORMATION FOR HANDICAPPED PATIENTS

The South Carolina Handicapped Services Information System (SCHSIS) has information on available services throughout the state for handicapped/disabled people.

SCHSIS has a computerized database of over 5,000 divisions that offer information on services ranging from therapeutic recreation, specialized equipment, rehabilitation, special education and much more. Accessing these services is as easy as dialing a telephone number. Once the SCHSIS counselor receives a call, he/she enters the service and area in which the service is needed into the computer and the computer responds with a list of agencies, specific contact people and telephone numbers, eligibility criteria, and other pertinent information such as availability of transportation, accessibility, hours of operation, etc.

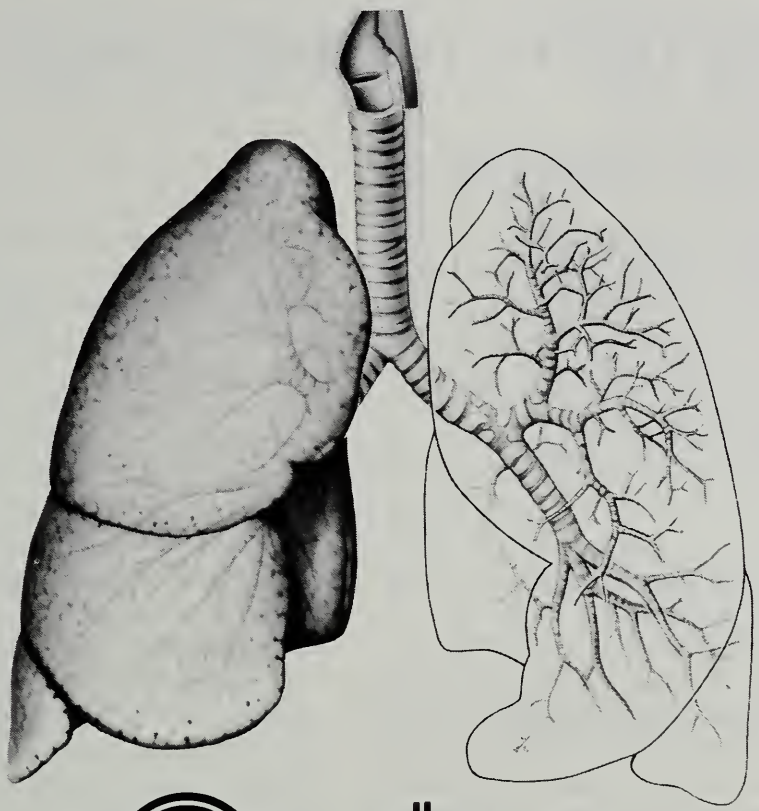
To obtain additional information, request brochures for your patients or to ask about services available in your area for a patient, please call 1-800-922-1107 (in Columbia, call 777-5732).

CAPSULES...

Erick N. Russow, M.D. of Pendleton, and Herbert R. Zatzkin, M.D. of Johns Island, are approved as SCMA affiliate members by the SCMA Board of Trustees. Approval was granted at the recent September Board Retreat on Hilton Head Island.

Mel Stuckey, M.D., is appointed to the Health and Human Services Finance Commission Advisory Board. Stuckey will serve as a replacement for Halsted Stone, M.D., who recently resigned due to other commitments.

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Administer cautiously to allergic patients.

Pseudomembranous colitis has been reported with virtually all broad-spectrum antibiotics. It must be considered in differential diagnosis of antibiotic-associated diarrhea. Colon flora is altered by broad-spectrum antibiotic treatment, possibly resulting in antibiotic-associated colitis.

Precautions:

- Discontinue Ceclor in the event of allergic reactions to it.
- Prolonged use may result in overgrowth of nonsusceptible organisms.
- Positive direct Coombs' tests have been reported during treatment with cephalosporins.
- In renal impairment, safe dosage of Ceclor may be lower than that usually recommended. Ceclor should be administered with caution in such patients.
- Broad-spectrum antibiotics should be prescribed with caution in individuals with a history of gastrointestinal disease, particularly colitis.
- Safety and effectiveness have not been determined in pregnancy, lactation, and infants less than one month old. Ceclor penetrates mother's milk. Exercise caution in prescribing for these patients.

Adverse Reactions: (percentage of patients)

Therapy-related adverse reactions are uncommon. Those reported include:

- Gastrointestinal (mostly diarrhea): 2.5%.
- Symptoms of pseudomembranous colitis may appear either during or after antibiotic treatment.
- Hypersensitivity reactions (including morbilliform eruptions, pruritus, urticaria, erythema multiforme, serum-sickness-like reactions): 1.5%; usually subside within a few days after cessation of therapy. These reactions have been reported more frequently in children than in adults and have usually occurred during or following a second course of therapy with Ceclor. No serious sequelae have been reported. Antihistamines and corticosteroids appear to enhance resolution of the syndrome.
- Cases of anaphylaxis have been reported, half of which have occurred in patients with a history of penicillin allergy.
- Other: eosinophilia, 2%; genital pruritus or vaginitis, less than 1%.

Abnormalities in laboratory results of uncertain etiology

- Slight elevations in hepatic enzymes.
- Transient fluctuations in leukocyte count (especially in infants and children)
- Abnormal urinalysis; elevations in BUN or serum creatinine
- Positive direct Coombs' test
- False-positive tests for urinary glucose with Benedict's or Fehling's solution and Clinitest® tablets but not with Tes-Tape® (glucose enzymatic test strip, Lilly)

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TOWARDS LESS PICTURESQUE SPEECH

ALLEN F. SHAUGHNESSY, PHARM. D.*

On the occasion of our twin sons' birth, I had the opportunity to become, for a short time, a health care consumer rather than provider. Our boys were born several weeks premature and spent the first week of life in a neonatal intensive care unit. My wife and I held a daily vigil in the NICU, in awe of the miracle of life. During this time, I was not a health care professional but another anxious father inquiring to the nurses and physicians of my sons' progress. The answers my wife and I received were worth noting, not only for their lack of content but for their style.

The first piece of information we received was soon after my wife was admitted with premature rupture of membranes. Her nurse told us that the doctor would be in shortly to collect some amniotic fluid to do "a test to check the babies' lungs." A few minutes later, the charge nurse popped in and mentioned that they were preparing to gather fluid to "test for fetal lung maturation." Finally, it was the obstetrician's turn to tell us that "we'll check an L/S ratio to determine lung maturation." Fortunately I was there to interpret for my wife that these were indeed all the same procedure.

Our next encounter with obfuscation occurred while spending time in the NICU trying to see past the tubes and monitors to get to know our babies. The nursing staff tried to be encouraging, telling us that "their 'lytes were normal," that our precious Joshua ("Boy B") was "retracting" less, that they didn't have to eat because they were getting "hyperal," that "his 'crit is fine today," and that the medication running into his abdomen was "to keep his UAC from clotting off." After each of these pearls, my wife would lean over to me, trying to read the emotion in my face, and ask if whatever was just said was good or bad. We discovered that every parent walking through the door of the NICU is assumed to have a thorough knowledge of "Medspeak."

Medspeak has been defined as a foreign medical language, designed to allow the user to speak quickly and appear knowledgeable, while hiding the true meaning of what has to be communicated, i.e., "a verbal smoke screen."[1] Medspeak involves the use of polysyllabic and mystifying terms instead of the more straightforward and obvious, such as "symptomatology" for "symptoms," or "prior to" for "before," and so on.[1] This language is widespread in medicine. It can be used to provide the user a hiding place to avoid the challenges that clarity brings.

Medspeak is confusing to the learned professional, and is doubly so to the emotionally involved parent (or patient), who looks for reassurance in every word. He finds none in words he cannot understand. Highly technical terms intimidate the listener, and contribute feelings of inadequacy and stupidity to the already insecure, anxious and frightened patient. No one wants to feel "dumb" or annoy the doctor with "silly" questions. People who do not hesitate to ask their mechanic to explain in plain English why their car makes funny noises would never think of exposing their stupidity by asking their doctor or nurse what a "crit" is or what kind of "lights" they are talking about.

So why is the use of medspeak and medical jargon in communication with patients so prevalent? In most cases it is because we are not sensitive to the breakdown of communication. We, as health care professionals, speak a common language among ourselves but find it difficult to "change gears" and respond to patients in another. I overheard a colleague telling a patient to start taking her quinidine "TID" instead of "BID" (to which the patient nodded her head in understanding!). We find it difficult to translate, and since no demands are put on us to do so by the patient, we don't. We also must be aware of the danger of using medspeak, unconsciously or not, to detach or remove ourselves from uncomfortable or unpleasant situations. It creates a strong barrier in communication with the patient which compromises our effectiveness.

As consumers of health care become more sophisticated and demanding, all health care pro-

* Lexington Family Practice, P. O. Box 226, Irmo, S. C. 29063.

viders will need to improve communication with patients. From physicians to lab technicians, a conscious effort must be made to communicate effectively. Even with all of the technical achievements that have become a part of medicine, to both patient and provider, communication is still the cornerstone of effective and satisfying medical care. □

REFERENCES

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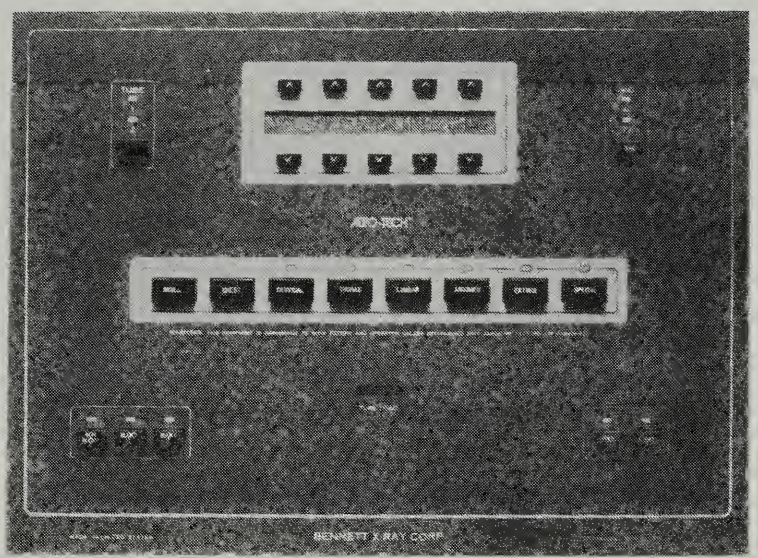
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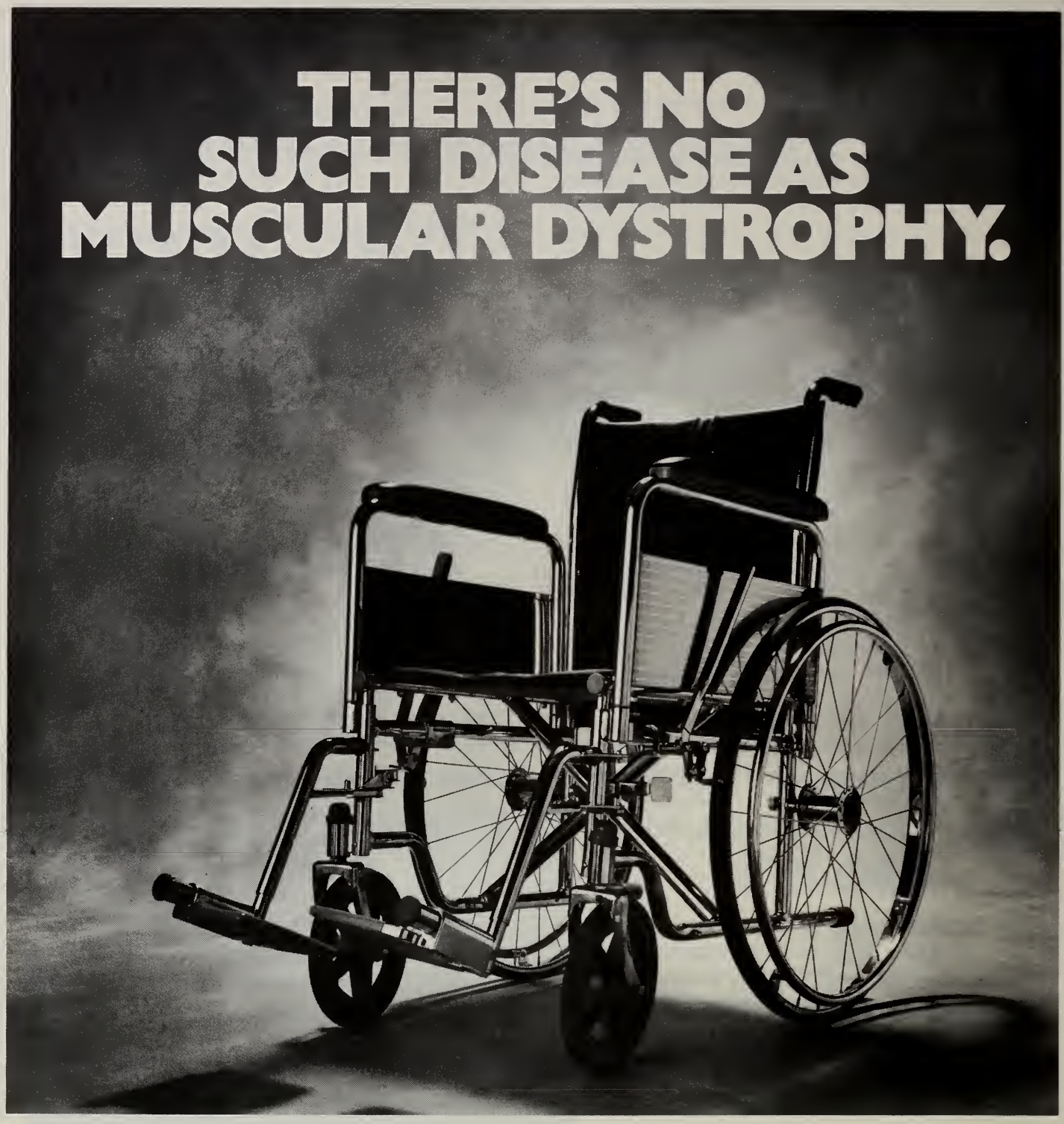
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Muscular Dystrophy Association, Jerry Lewis, National Chairman

FINANCIAL CHECKUP

MARTIN LEFKOWITZ
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Vol. 6, Issue No. 10 October 1986

DIRECT INVESTMENTS: WHAT'S IN STORE?

New areas of investment make the direct approach an exciting alternative for many investors..... cont'd

Entertainment

The current economic scenario and the tax environment present new opportunities for direct investments in entertainment, particularily in motion pictures, television and radio broadcasting and cable television.

Recently, expansion in these areas of the industry has been tremendous. This growth is attributed to a more relaxed regulatory environment, the development of new technologies such as pay TV, home videocassettes and cable TV, and the ever-growing consumer demand for more entertainment products, according to industry analysts.

Motion Pictures

Some of the financial risk in a film investment has been reduced by ancillary markets such as home video, pay TV and videocassettes. Today, most films are sold to these markets for a minimum guarantee or advance, irrespective and in advance of the film's performance at the box office. Therefore, ancillary markets can help cover a portion of the production and advertising costs of even a modestly budgeted film.

Recent E.F. Hutton film partnerships have been structured to produce cash flow to the investor based on film performance, and contained certain guarantee features secured from the joint venture studio partner.

Broadcasting

1985 was a banner year for the broadcast industry, according to Broadcasting magazine. Activity within the industry has been stimulated by a relaxation in the regulatory rules governing broadcast property ownership and the continuing growth in TV advertising revenues.

Television remains the medium of choice for advertisers who are buying time for traditional as well as new products. The number of television stations, however, is limited by regulation. The results are generally high operating margins (35% on average and 50% for mature stations in larger markets) and good cash flow. Also, according to industry analysts, television advertising revenues have been increasing by a 12% annual average for the past five years.

A limited partnership is one of the ways to invest directly in a broadcast asset. Through the limited partnership structure, investors benefit directly from the

cash flow, which may be partially sheltered in the early years, and have the potential to realize appreciation upon the station's sale or refinancing.

Cable Television

For many participants in the cable industry, the early years of capital expenditure have ended, and many are experiencing record positive cash flow. Industry analyst Paul Kagan Associates expects this trend to continue. Industry deregulation has also benefitted the industry, and it has become easier for cable operators to raise subscriber rates.

Industry revenues grew from $345 million in 1970 to $8.7 billion in 1985 (a 24% average annual increase). In addition, the number of subscribers grew from 6 million to 36 million during that time period, as the number of programming options escalated, according to Paul Kagan Associates.

Hutton-sponsored limited partnerships in this area offer tax benefits in combination with capital gains potential.

Oil and Gas

The oil and gas industry is one of the traditional areas for direct investments. Although oil and gas prices have fallen recently, some studies indicate that prices may have bottomed out and may substantially rise over the next three years. Coupled with dramatically reduced property values and operating costs experienced industry-wide, some analysts take a contrarian point of view and believe that the next few years may present good investment opportunities.

Hutton has offered various programs in this area in the past, and will review many possible programs in the next few years that may be economically viable to the limited partners. These include both public and private completion and drilling programs.

Equipment Leasing

Under existing tax laws, an investment in equipment leasing can provide important benefits to investors. These programs generally provide high tax benefits in the early years of the investment and taxable income towards the end. Investors who anticipate being in a lower tax bracket in several years would benefit most from this type of program. The proposed tax revisions - particularily the repeal of the finance leases and the change in the depreciation schedule - if enacted, pose the largest threat to equipment leasing programs. So, 1986 may be the last and best year in which an investor can enter into a leasing program and maximize his or her tax benefits.

For further information about how direct investments can help you achieve your investment goals, or about specific offerings, please contact me.

* *

The information contained herein has been obtained from sources believed reliable, but is not necessarily complete and cannot be guaranteed. Any opinions expressed are subject to change without notice. Neither the information presented nor any opinion expressed constitutes a representation by us or a solicitation of the pruchase or sale of any securities. South Carolina Medical Association and E.F. Hutton & Company, Inc. 1986

If you would like to receive further information on any of the topics covered in this newsletter, please write to Martin Lefkowitz, CFP, E.F. Hutton & Company, Inc., 2700 Middleburg Drive, Suite 200, Columbia, SC 29204; or Call (800) 922-1112.

Editorials

RUDE PHYSICIANS

Emily Post unequivocably states that it is ill-mannered to place a telephone call to someone else and then have that person wait while you come to the phone. Indeed, this seems to me to be so obviously ill-mannered that it seems strange that Emily Post felt it necessary to comment on such a practice. Perhaps she said it for the benefit of her Yankee readers? Unfortunately, the answer is "no" — this scenario happens all too frequently even among South Carolina physicians. The mentality of such a rude caller would seem to be: "My time is more important than yours and even though *I'm* phoning *you, you* (rather than I) must wait to hear what *I* have to say."

With this thought in mind, I asked myself: "Who are the most important and busiest physicians that I know who sometimes call *me*. Several immediately came to mind: Dr. Charles Bryan (editor of our *Journal);* Dr. John Martin (busy internist in Anderson and former president of the South Carolina Society of Internal Medicine); and Dr. Charles Corley (head of the division of hematology at Emory University). When these gentlemen call me, they are always on the line when I get there. They don't seem to have to impress me by having *me* wait for *them*. Further, I would say that their mothers raised them properly.

Sufferers of this rudeness are not only physicians receiving calls from consultants but the consultants as well. The only valid reasons that I can think of for ever asking the physician *you* are calling to "hold" are (1) the need to resuscitate a patient or (2) the need to clamp a bleeding artery.

Who is the physician who telephones you, interrupts your practice, and then leaves you hanging with the message from a secretary: "Please hold for Dr. _____ ?" It is probably a physician who has yet to make his mark, or who has not had the time or insight to develop the humility that most good doctors achieve sooner or later. For whatever reason, I'm sure that his mother (not to mention Emily Post) would be embarrassed.

William H. Hunter, M.D.
One Hunter Court
Clemson, SC 29631

PROFESSIONAL COURTESY

This [1876] was a significant year, for the introduction of the telephone was to produce a great change in medical practice, adding tremendously to the physician's range and usefulness, but destroying forever whatever opportunity for fruitful contemplation had been inherent in the former slowness of communication.

— Joseph I. Waring[1]

It has never been easier to insult people inadvertently.

— Edith Martin ("Miss Manners")[2]

Historically, the term "professional courtesy" has usually denoted medical care given gratuitously to other physicians and their families.[3] Historically, codes of medical ethics also addressed the manner by which physicians related to each other. Today, such codes of etiquette have all but disappeared. "Miss Manners" observes that "nobody knows anymore what true social obligations are. A mockery has been made of traditional American openness, so that everyone is considered open, all the time, to all social advances."[2]

In the preceding editorial, Dr. William Hunter expresses a lament shared by many. The instant access afforded by beepers and telephones vastly facilitates communication, but — if untempered — denies us of the right to retain even a measure of control over our time. Striving to be accessible, most physicians feel the obligation to respond to telephone calls from other physicians during normal office hours. Dr. Hunter points out the need for the calling physician to consider the likelihood that the receiving physician will usually be en-

gaged in other activities which he or she believes to be valuable and necessary.

Prior to entering practice in Columbia some years ago, I asked an older physician and family friend whether he had any advice. His only suggestion was to "just treat everyone else like *you* would like to be treated." Over the years, I've contemplated what *I* would say if given a *carte blanche* to write a code of Golden Rules for telephone communications. Given Dr. Hunter's initiative, here goes:

1. *Be available.* It is best, as Dr. Hunter suggests, to place the call oneself. If the communication is not sufficiently important to be worth *your* time to dial the telephone, then it is probably not worth the other person's time, either. If dialing the telephone is a source of frustration to you, then have your secretary perform this task — but be at your desk in a state of ready anticipation.

2. *Be considerate.* If the call is not about an urgent patient-related matter, ask the physician's secretary whether he's terribly busy. If the call does not directly concern a patient, thus advise the secretary and ask if there might be a more convenient time to communicate with the physician.

3. *Be concise.* Unless you *know* that your listener is the sort of person who loves to stop what he's doing and put his feet up on the desk, get to the point quickly. Remember that the familiar "got a minute?" is usually a lie. The average communication between two human beings requires at least four minutes and most communications between physicians probably take somewhat longer. Try to make your opening remarks answer the questions addressed in a good newspaper reporter's lead paragraph: *who? what? when? where? how?* It may be useful to estimate the approximate length of the request, question, or problem (for example: "Joe, this is somewhat complicated and will probably take about five minutes for me to tell adequately — is this a good time for you?").

4. *Plan your call-back.* If the other physician is not available and you wish to have him or her return your call, remember that you are asking *him* to do *you* a favor. Surely, there are few things more frustrating than to try to return a call to an incessantly-ringing telephone or — alternatively — to be told by someone's secretary "he can't come to the phone — he's with a client (or patient)" (if *he* can't, how does he expect *you* to?!). Consider the possibility that a call-back isn't even necessary (for example: "tell him that he can expect a *letter* from me this week regarding . . .").

When requesting a call-back, it is helpful to indicate to the other physician's secretary two factors: (1) the relative urgency of the need to communicate (e.g., "as soon as possible" or "this isn't urgent, but I'd like to talk to him sometime this week"); and (2) a time when you know that *you'll* be available. If you're about to make a series of calls (some of which may be rather lengthy) or if you *know* that you'll be unavailable during certain time frames, then indicate this to his or her secretary.

5. *Whenever possible, have your secretary communicate with his or her secretary.* Frequently, communications can be distilled into a one-sentence question requiring a one-sentence (or even one-word) answer. Both of you will save a great deal of valuable time if you dictate the question to *his* secretary and indicate that the answer can be similarly dictated to *your* secretary. This approach lends itself especially to questions requiring only a simple "yes or no" response.

6. *Whenever possible, have your ward clerk communicate with his or her secretary.* Through thoughtful use of the telephone, it's possible to be considerate of other physicians with the expenditure of little of your time and none of theirs! Frequently, physicians (either referring physicians or various consultants) have reason to be concerned about a patient even though they may not be actively involved in the patient's care at that time. Make it a practice to request ward clerks to "notify Dr. _____'s office of . . . (admission to the hospital; successfully-completed procedure; transfer to another nursing unit; discharge from the hospital)." It is frustrating to go out of one's way to pay a "social" visit to a patient (that is, to check on the patient's progress and offer a word of encouragement even though not actively involved in the patient's care) only to find oneself uninformed about such events. Ward clerks can do wonders!

Formulating rules of etiquette on the basis of the Golden Rule is hazardous. Among the many differences between people are differences in the way by which *they* would like to be treated. "Miss Manners" observes:

> ". . . the trouble with inventing etiquette forms is that it is a game everybody can play. Each person claims not only the right to design his own etiquette, but also to be in-

sulted if others do not observe it, even if he has not troubled to acquaint them with his preferences."[2]

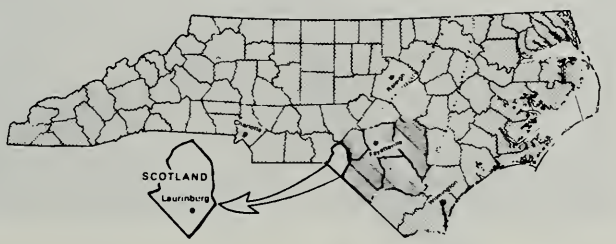
It is necessary, therefore, to be sensitive to the preferences of the person whom you are calling.

We can anticipate that further advances in communications (such as a cellular telephone in every physician's car) will make instant communication even easier — and also more frustrating. Perhaps the time has come for all of us who are interested in the future of our profession to consider seriously the possibility of resurrecting the notion of codified rules of conduct.

— CSB

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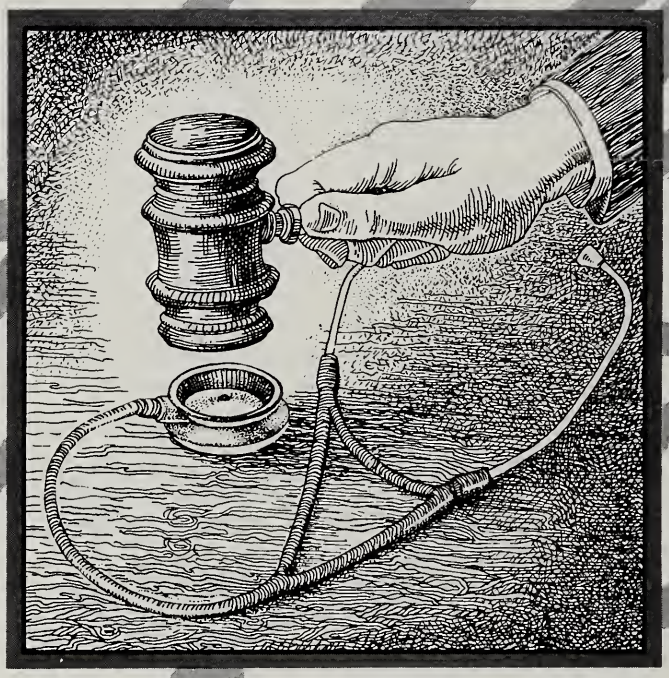
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ON THE COVER: THOMAS JEFFERSON McKIE, M.D. 1828-1898

A retiring man, often in poor health, Thomas Jefferson McKie, M.D., gave frequently of himself to his profession and state. Keenly interested in the health of the population in Edgefield county, Dr. McKie played a significant role in the pre-Confederate War and postwar reconstruction in medicine and politics in South Carolina. Born September 26, 1828 in Edgefield County, Dr. McKie enjoyed the traditional education, receiving tutoring in Greek and Latin prior to his taking up his medical training at both the medical college in South Carolina and at the University of Pennsylvania where he received his degree in 1847. Following his training, he attempted to open a practice in medicine, but because of the War between the States which he referred to as the "inter-state war," he enlisted as a Private in the Confederacy. Due to his health he could not serve in the regular army and, therefore, returned to join the volunteer unit commanded by Captain Robert Meriwether. He initiated his service as a foot soldier and fought in the first battle of Manassas. However, his health was not adequate for this service and he was reappointed as Assistant Surgeon in the Tenth Regiment of the South Carolina Volunteers. He functioned throughout the war in a medical capacity and returned to the Edgefield area at its cessation.

In the post war era the plight of the freed Negro population suffered due to a lack of support and access to medical attention. As described by J. C. Nott in his "Health and Longevity of the Southern Seaports," it has been pointed out that during the prewar era in South Carolina, the death rates of whites and negroes had been nearly the same throughout the state but that the mortality among free negroes in northern cities was two to three times that of slaves in Charleston. Dr. McKie had a keen interest in this subject and in his paper "The Negro and Some of His Diseases, as observed in the Vicinity of Woodlawn, South Carolina," he comments that "this paper is offered because of the little attention the subject has of late received at the hands of the profession, and because of its social and economical as well as medical importance to a race of people whose political importance, for the past score of years, has well nigh overshadowed his physical well-being." Dr. McKie addressed the subject of diseases in the freed Negro population and brought the conditions to the attention of the medical profession in South Carolina, commenting that "having, in a measure, lost his value to those who had his welfare most at heart, by the Emancipation Act, for which he is in no wise responsible, he (the Negro) has only been cultivated as a voter . . . in total disregard of physical or moral health." Dr. McKie went on to become a leader in the early interest in black medical conditions and in the specific and unique responses of that population to many of the common diseases so prevalent in the reconstruction period in South Carolina. Interestingly, Dr. McKie's original interest and publication in this area have only recently received a recommitment of interest in our present medical philosophy.

Because of his interest in social and medical activities, Dr. McKie presented many other papers which were frequently published in the Transactions of the South Carolina Medical Association. He was offered the Presidency of the organization on numerous occasions, but because of his modesty he declined and it was not until 1895 that he finally accepted the position of President of the South Carolina Medical Association. He later served as a Delegate to the American Medical Association and was to have represented South Carolina at the British Medical Association, but because of his failing health was unable to attend.

Dr. McKie is another example of the splendid physicians who contributed notably to the history of medicine in South Carolina. Dr. McKie died at his home in 1898.

— Thomas M. Leland, M.D., Ph.D.



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President's Page



MEN, WOMEN, YOUNG AND OLD ALIKE — SCMA, AMA INVOLVEMENT IS CRUCIAL

When I graduated from medical school in 1958, there were two women in my class. Now females make up about one-third of the student body of this country's medical schools. This steady increase in numbers of women physicians has not been accompanied, sad to say, by their increasing involvement in organized medicine. The AMA and SCMA perceive it is high time we invited and encouraged that involvement. Truth be known, we "chauvinist males" are probably more responsible for the women's lack of involvement than are the women themselves.

The American Medical Women's Association (AMWA) is going to have its national meeting in St. Louis in November. I plan to be there for at least part of this meeting. We have a lot of female physicians in the state and their involvement is crucial to SCMA and AMA.

Talking about this involvement brings me to discuss with you the newly formed, long awaited and hoped for "Young Physicians Section" of the AMA. It has been long recognized that the physician between 30 and 40 years of age — that period after residency up to the time the practice gets rolling good — has been all too often lost in the activities of organized medicine. A relatively small percentage join and get involved outside of their local, component societies.

This involvement by the young doctors is being promoted by the Young Physicians Section and we are making plans for a SCMA Section organizational meeting at the next meeting of the House of Delegates in Charleston in April. The Board of Trustees has elected Dr. Roger Gaddy of Winnsboro to be our Young Physician Delegate, and Dr. Jim Lindsey of Conway our Alternate Delegate, to the AMA Interim meeting in December.

Whether male or female, involvement in organized medicine from the day a young person enters medical school, through residency, through their early years of practice to "mature years" and old age, is the way things ought to work. SCMA is endorsing, encouraging and supporting that involvement at every level.

Walt Roberts

— Walter J. Roberts, Jr., M.D., *President*

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VENOUS THROMBOEMBOLISM

JAMES A. MAJESKI, M.D., Ph.D.*

Venous thromboembolism is a serious and potentially fatal disorder which frequently influences the course of sick, hospitalized patients, but occasionally affects ambulant, healthy individuals. It is one of the most important complications of both medical and surgical patients and is responsible for 200,000 deaths a year in the United States. Approximately one-half of these deaths occur in association with disease processes which would have been cured had the patient not succumbed to pulmonary embolism. In addition to the potential mortality from pulmonary embolism, venous thromboembolism is also responsible for significant morbidity due to the acute event itself, as well as a 50 to 70 percent incidence of the post-phlebitic syndrome which develops in patients following proximal venous thrombosis.

The postoperative patient is susceptible to the development of venous thromboembolism. Multiple studies have indicated that 15 to 25 percent of all patients undergoing abdominal or thoratic surgical procedures will have a positive I^{125} fibrinogen scan indicating the presence of surgical thrombi within the leg veins. One-tenth percent of these patients will have a fatal pulmonary embolism and an additional 0.5 to two percent will suffer non-fatal pulmonary emboli.[1] Most advances in the management of venous thromboembolism have come as a result of more accurate noninvasive methods of early detection and the recognition of the vital role of prophylaxis in the prevention of venous thromboembolism.

* Department of Surgery, Medical University of South Carolina, 171 Ashley Avenue, Charleston, S. C. 29425-2270.

PATHOPHYSIOLOGY

Venous stasis, injury to the venous wall, and a hypercoagulatable state are three main factors which predispose to venous thrombosis. The thrombotic process is believed to begin behind the valve cusps. The original nidus is composed of an aggregate of platelets and fibrin which tapers the lumen as it propagates proximally. As blood is slowed, the thrombus propagates both proximally and distally until finally the lumen is occluded. Propagation then continues in the form of a red coagulum composed principally of red blood cells within interspersed fibrin. The normal venous endothelium is extremely thrombo-resistant. The negative charge on the endothelial cell surface repels adhesion of platelets. In addition, the cell surface is coated with a glycoprotein calyx containing heparin-like substances. The cells themselves synthesize PGI_2 which is a potent, platelet anti-aggregating agent and distal vasodilator.

In the postoperative period the thrombotic process appears to be initiated by the concurrence of several events. Stasis has a multifactorial impact on the endothelial cell. It leads to local venous dilation with endothelial cell separation, consequently, exposing the basement membrane. In addition, the presence of local anoxia further damages the endothelium. The stagnant blood leads to accumulation of procoagulants which overwhelm the normal inhibitory mechanisms. Direct venous trauma, especially in the case of hip surgery, has been shown to be casually very important in initiating the thrombotic process.[2] Once the basement membrane is exposed, intrinsic pathway activation occurs and initiates the

coagulation cascade which culminates in thrombosis, unless local mechanisms are able to reverse the process.

The risk factors predisposing to the development of venous thromboembolism include advanced age, malignant disease, immobilization, congestive heart failure, previous venous thromboembolism, myocardial infarction, paraplegia, venous varicosities, obesity, exogenous estrogens and pregnancy. Elderly patients typically are more likely to have venous dilation and stasis due to immobility. Venous fibrinolytic activity is known to decrease with advanced age. Malignancy predisposes to venous thromboembolism through activation of tissue thromboplastin from malignant cells with reduction in fibrinolytic activity. Venous compression or direct tumor invasion are further risk factors. Long-standing hematological abnormalities such as heredity antithrombin III deficiency or acquired conditions such as polycythemia and decreased fibrinolytic activity are similarly associated with an increased risk of venous thromboembolism.

CLINICAL FEATURES

Most venous thrombi are asymptomatic.[3] Symptoms are the result of either outflow obstruction, local inflammation within the vessel wall and perivascular tissues, or by the embolization of venous thrombi into the pulmonary circulation. The common local manifestions are pain and tenderness within the affected extremity. The severity and site of pain are probably a result of the local inflammation within the vessel wall. The pain of venous thrombosis is not characteristic. It may be an ache, cramp, sharp, dull, severe or mild. It may be intermittent or constant, but is frequently aggravated by movement and weight bearing and is usually associated with local tenderness. It typically improves after several days of bed rest and treatment, particularly with leg elevation.

Swelling may occur as a result of obstruction of large proximal veins or inflammation of perivascular tissue. When swelling is due to proximal venous obstruction, it occurs distal to the obstruction and may be painless. Swelling due to inflammation, however, is localized and is associated with severe tenderness.

Discoloration is an uncommon and nonspecific manifestation of venous thrombosis. The leg may be pale, cyanotic, or reddish purple in color. Phlegmasia cerulea dolens is a term used to describe the marked swelling and cyanosis which occurs with obstructive ileofemoral venous thrombosis. When a vessel which is easily palpable becomes thrombosed, it may be felt as an obvious cord. This is the result of both thrombosis of the vessel as well as edema of the surrounding perivascular tissue. It is an uncommon sign of venous thrombosis and, even if present, does not differentiate acute venous thrombosis from long-standing disease unless the cord is obviously warm and tender.

DIAGNOSIS

The clinical diagnosis of venous thrombosis is insensitive and nonspecific. Patients without symptoms or with relatively minor symptoms and signs can have extensive venous thrombosis, while those with overt clinical features suggestive of deep venous thrombosis frequently have no objective evidence of Deep Venous Thrombosis (DVT). It is generally recognized that the accuracy of clinical diagnosis for venous thrombosis is approximately 30 percent.

The differential diagnosis of DVT includes muscle strain or tear, direct muscle trauma, spontaneous muscle hematoma, arterial insufficiency, ruptured Baker's cyst, arthritis or tendonitis, cellulitis, bone pathology, varicose veins, pregnancy and the post-phlebitic syndrome.

Patients who present with the clinical features of apparent venous thrombosis comprise approximately 50 percent of symptomatic patients and will require further investigation to establish the diagnosis. Those patients in whom clinical examination reveals an obvious alternative diagnosis, such as cellulitis or arthritis, will not require further investigation for thrombosis. In a smaller segment of the population, usually less than one percent, the clinical features, e.g. phlegmasia cerulea dolens, will be so characteristic that investigation for thrombosis is not necessary. Those tests which have proven themselves to be valuable in the objective diagnosis of venous thrombosis include venography, which is painful, invasive, and may itself induce phlebitis in a small percentage of patients; impedance plethysmorgraphy, a sensitive and specific test for proximal vein thrombosis in symptomatic patients, but which is insensitive to the presence of calf vein thrombi;

Doppler ultrasound, sensitive and specific for proximal vein thrombosis, but also equally insensitive to calf thrombi and subject to significant technician error; and fibrinogen leg scanning which is sensitive to calf and distal thigh vein thrombi, but is insensitive to proximal thigh and iliac vein clot. Fibrinogen leg scanning may not become positive for 72 hours and should only be used as a diagnostic test when combined with impedance plethysmography.

Impedance Plethysmography: In patients with clinically suspect venous thrombosis, a positive impedance plethysmograph (IPG) can be used to make therapeutic decisions in the absence of clinical conditions known to produce false positive results. A normal result essentially excludes the diagnosis of proximal vein thrombosis, although calf thrombi may be present. False positive results may occur with disorders which interfere with arterial inflow or venous outflow. These include severe congestive heart failure, constrictive pericarditis, severe arterial insufficiency, hypotension or external compression of veins. The most important benefit of IPG is its ability to exclude the diagnosis of DVT especially in outpatients, thus avoiding unnecessary hospitalization. In one study by Wheeler, three-fourths of patients suspected of having DVT were in fact shown to be free of disease and were thus spared hospitalization. On followup of such patients, less than 0.5 percent developed venous thrombosis and no pulmonary embolism was ever proven.[4]

Doppler Ultrasound: Like IPG, Doppler ultrasound is sensitive to symptomatic proximal vein thrombi, but insensitive to calf thrombi. Its major drawback is the fact that it is subject to considerable technician skill, both in performance and in interpretation. In skilled hands, however, it is almost as sensitive as IPG.

I^{125} Fibrinogen Leg Scanning: Fibrinogen leg scanning detects thrombi which are actively accreting fibrin in the calf veins and in the distal half of the thigh. False positive results occur if scanning is performed over a hematoma, a large wound or an area of inflammation. In the absence of these conditions, leg scanning is both sensitive and specific for acute calf and lower leg venous thrombi. Fibrinogen leg scanning should never be used as the sole diagnostic test because it fails to detect proximal thrombi in approximately 30 percent of the patients and because of delay which may be as long as 48 or 72 hours before the test becomes positive. In addition, thyroid suppression is required, all thrombi may not be detected, and there is a small but definite risk of hepatitis.

Venography: Venography is the most definitive method currently available and, if adequately performed and interpreted, can be used reliably to confirm or exclude the diagnosis in patients with clinically suspicious DVT. The primary venographic criteria for DVT is the demonstration of a thrombus within the lumen of the vein. However, secondary criteria, such as nonfilling of veins, flow diversion in to the superficial veins, and segmental defects are also valid.

Because of the discomfort and small but potential risk of venography, many centers have replaced it with noninvasive testing in the diagnosis of patients with clinically suspect DVT. In those patients who present with clinical features compatible with DVT, an IPG is ordered immediately upon admission. If positive, therapy can be initiated without the need for venograms. If the test is negative, three alternative approaches appear valid: (1) repeat the IPG every two to three days and do not treat as long as the test remains negative; (2) obtain a venogram; (3) inject radioactive fibrinogen and scan for seventy-two hours. Since the risk of pulmonary embolism and postphlebitic syndrome are low as the IPG remains negative, I favor the first approach.

PROPHYLAXIS

Two approaches can be used to prevent clinically significant venous thromboembolism. These are (1) primary prophylaxis, or (2) the early detection and aggressive treatment of subclinical venous thrombi. Primary prophylaxis is more effective and less expensive and is the method of choice in most clinical circumstances. Early detection may be used to complement prophylaxis in very high risk patient groups, but should not be used to replace it. A number of methods have proven themselves effective in the prevention of deep venous thrombosis. These include low dose heparin, intermittent pneumatic compression, oral anticoagulant and dextran. Other forms of prophylaxis which have shown promise, but have not been used as extensively, include aspirin, graduated compression stocking, electrical calf

stimulation and a combination of dihydroergotamine and low dose heparin.

Low Dose Heparin: Low dose heparin is given in amounts of 5,000 units, two hours preoperatively and then every eight to 12 hours postoperatively. This therapy has been shown to be effective in reducing the frequency of postoperative venous thromboembolism. Unfortunately, it is associated with a slight but significant increase in wound hematomas. It is important to continue prophylaxis for the entire high risk period. Low dose heparin has been shown not only to decrease the frequency of I^{125} fibrinogen detectable calf vein thrombi, but also the frequency of proximal open GU surgery and above knee amputation.[5]

External Pneumatic Compression: This highly effective form of prophylaxis has historically limited use because previous compressive devices were cumbersome and inconvenient. The newer devices are better tolerated by the patients even when worn for long periods. This is an important consideration since the devices are ineffective if removed before the patient is fully ambulatory. These devices are applied preoperatively in the operating room and should be worn as long as the patient is in the bed for the entire postoperative period.[6] Intermittent pneumatic compression prevents venous thrombosis in general surgical and neurosurgical patients and in patients having major knee surgery. It does not appear effective when used in patients having hip surgery.

Low Molecular Weight Dextran: When dextran is given in amounts of at least 500 mg over a four to six hour period, starting during the operation and continued daily for two to five days, it is an effective form of prophylaxis. The use of dextran is associated with a slight risk of bleeding when given at the time of surgery. It is an acceptable form of prophylaxis and provides an alternative to anticoagulation and intermittent pneumatic compression in patients undergoing several surgical procedures or elective hip surgery.[7]

Warfarin: Oral anticoagulants given in doses that double the control prothrombin time are effective in preventing the occurrence of venous thrombi and their extension. This approach is most effective when started preoperatively, so that there is an anticoagulant effect at the time of surgery. Used in this way, oral anticoagulants produce an increased risk of bleeding which is unacceptable to most surgeons.[8]

The choice of prophylaxis should be based on the risk of DVT for each individual patient. Low risk patients may be satisfactorily prophylaxed with early ambulation and graduated compressive stockings. However, moderate risk patients require low dose heparin or intermittent pneumatic compression. High risk patients should have continuous low to moderate dose heparin or intermittent pneumatic compression plus low dose heparin or, in extreme cases, oral anticoagulants.

The use of aspirin as prophylaxis for venous thrombosis has been looked at more recently as a greater appreciation for the role of platelets in the initiation of venous thrombosis has been developed. This technique has not been widely studied and thus far has only been shown to be effective in undergoing hip surgery. Dihydroergotamine is a vasoconstrictor that prevents venous dilation and has been shown to be an effective prophylaxis against venous thrombosis when used in combination with low dose heparin.[9]

TREATMENT

Once venous thrombosis has occurred within the popliteal or proximal veins, effective treatment must be initiated promptly to prevent extension of the thrombus and possible fatal embolization. The cornerstone of treatment for venous thromboembolism is effective therapeutic doses of heparin. Heparin is a complex, mucopolysaccharide of highly variable molecular weight. A related substance, heparin sulfate, is present on the surface of endothelial cells and may serve a physiologic role by accelerating the inactivation of thrombin and activated Factor X, although its potency is only approximately 1/75 that of heparin. Heparin exerts its major anticoagulant effect in the presence of a plasma co-factor, an Alpha-2-globulin known as antithrombin III. Antithrombin III is a naturally occurring inhibitor of a number of activated clotting factors which include Factors XII, XI, IX, X and thrombin. Because the blood coagulation process is amplified at each successive step, during anticoagulation less heparin is required to inhibit blood coagulation early in the activation process than in later stages. When fibrin is formed, concentrations of heparin are required to inactivate throm-

bin. Therapy should be initiated, in average adults, by a bolus of approximately 10,000 units of heparin followed by a continuous infusion of 1,000 to 1,500/hr sufficient to maintain the APTT one and one-half to two times control levels. The half life of intravenous heparin is approximately one hour and, accordingly, a stable serum concentration is achievable only by continuous infusion. Continuous heparin infusion also results in a significant reduction in bleeding complications. Heparin should be continued at full doses for seven to 10 days with oral anticoagulation with warfarin initiated on the fourth or fifth day.

When a loading dose of warfarin is used, there is a rapid fall in Factor VII and a correspondingly rapid increase in the prothrombin time without effective anticogaulant protection. However, when warfarin is administered as a daily maintenance dose, although there is a less rapid fall in Factor VII, the fall in other vitamin K dependent factors is similar to that obtained when a loading dose is used. There is no rationale for use of loading doses in the initiation of warfarin therapy.

Recurrence of venous thromboembolism while on effective doses of heparin occurs in less than two percent of patients. During the three to six month period while on oral anticoagulants, recurrence is less than three percent. Following cessation of all anticoagulant therapy, a recurrence rate of 10 percent can be anticipated within the first year.

Recurrent Thromboembolism: Recurrent venous thromboembolism is uncommon if patients are treated with an adequate course of anticoagulant therapy. In all cases of suspected recurrence, it is important to establish whether symptoms and signs represent a true recurrence or whether they are complications of the initial event. When acute recurrence is confirmed, one should investigate for antithrombin III deficiency, plasminogen deficiency, or dysfibrinogenemia. Less common associated conditions, such as lupus erythematosus, polycythemia vera and malignancy should also be considered.

Recurrence during heparin therapy is extremely uncommon. If inadequate doses of heparin were being given to maintain the patient within therapeutic range, heparin should be continued at a more appropriate dose. If recurrence can be confirmed on adequate therapy, consideration should be given to caval interruption while continuing heparin therapy.

Documented recurrence during the course of oral anticoagulants requires readmission and reinstitution of heparin therapy. If there is a predisposing cause to the recurrence, one should continue oral anticoagulants for six months or longer until the risk factor is corrected. Spontaneous recurrence in the absence of predisposing causes would mandate oral anticoagulants being continued for at least one year. Repeated recurrence or documented antithrombin III deficiency would warrant continued use of oral anticoagulants indefinitely. A very small percentage of patients develop further recurrent venous thrombosis during long-term treatment with oral anticoagulants. These patients should be considered for other forms of therapy including long-term subcutaneous heparin, anabolic steroids and drugs that suppress platelet function. Although it is difficult to use heparin indefinitely because of the risk of nonhemorrhagic side effects, such as thrombocytopenia, skin necrosis and osteoporosis, a very small percentage of patients may be controlled only by long-term, moderate or full dose subcutaneous heparin therapy. □

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HUMAN IMMUNODEFICIENCY VIRUS-ASSOCIATED DISEASES IN CHILDREN

RANDOLPH F. WYKOFF, M.D., M.P.H., and T.M.*

In the past three years, the spectrum of human immunodeficiency virus (HIV, formerly known as HTLV-III/LAV)-associated diseases in children has become more clearly defined.[1-8]

While the criteria for the Acquired Immunodeficiency Syndrome (AIDS) in children (Table I) differ only slightly from the definition of AIDS in adults, and thus present relatively little diagnostic confusion to the clinician, the full spectrum of HIV-associated diseases in children is much less well-defined, often presenting significant diagnostic difficulty.

This paper will address four questions about HIV-associated diseases in children.

1) What are the risk groups for childhood HIV-associated diseases?

2) What clinical or laboratory findings support the inclusion of HIV-associated disease in the differential diagnosis of a child's illness?

3) What are the appropriate diagnostic tests for a child with possible HIV-associated disease?

4) What should be done for a child discovered to have a positive HIV serology with or without clinical disease?

RISK GROUPS

The risk factors for childhood HIV-associated diseases include both prenatal in-utero exposure and postnatal blood product transfusion associated exposure.

To date, the majority of children reported with HIV-associated diseases have been exposed because of maternal HIV infection. The most common risk factor appears to be parental intravenous drug use, though maternal prostitution, paternal bisexuality and parental blood product exposure should also be considered.

Some children have been exposed to HIV by postnatal blood product exposure, either as a transfusion of any blood component, often in the neonatal period, or from receipt of clotting factor, later in life.

To date, about 75 percent of all reported cases of childhood HIV-associated diseases have been due to prenatal exposures, about 15 percent due to postnatal exposures, with about 10 percent of the cases being inadequately investigated.[1-8]

Children exposed in utero are most likely to be non-white, reflecting the inner city predominance of intravenous drug use, and to present with symptoms earlier in life, with diagnosis often made before one year of age. Conversely, children exposed by blood products tend to be white, and often present with symptoms, and, therefore, diagnosis, later in life, though frequently still before the first birthday.

As of May 5, 1986, there had been 289 cases of AIDS in children, making up 1.4 percent of the 20,305 cases reported nationwide by that date.

FINDINGS

In addition to the criteria for childhood AIDS (Table I), a number of other findings are suggestive of HIV-associated disease in children.

Though the varied clinical presentations of HIV-associated diseases in children usually overlap significantly, any one of the following presentations (shown in Table II) may occur as an isolated finding:

(a) Virtually all reported cases of symptomatic HIV-associated disease in children have presented with some clustering of certain recognized, but non-specific physical findings. These are summarized in Table III, which includes an approximate percentage frequency of each finding in the published medical literature.[1-5, 7, 8]

(b) In most published series, the majority of children with HIV-associated diseases have had an unexplained lymphocytic interstitial pneumonitis, without evidence of demonstrable pulmonary pathogens.[3, 4, 7, 8]

(c) Between one-half and two-thirds of all children reported with symptomatic HIV-associated

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TABLE I
Provisional Case Definition for Acquired Immunodeficiency Syndrome (AIDS) In Children

For the limited purposes of epidemiologic surveillance, CDC defines a case of pediatric acquired immunodeficiency syndrome (AIDS) as a child who has had:

1. A reliably diagnosed disease at least moderately indicative of underlying cellular immunodeficiency and
2. No known cause of underlying cellular immunodeficiency or any other reduced resistance reported to be associated with that disease.

The diseases accepted as sufficiently indicative of underlying cellular immunodeficiency are the same as those used in defining AIDS in adults with the exclusion of congenital infections, e.g. toxoplasmosis or herpes simplex virus infections in the first month after birth or cytomegalovirus infections in the first six months after birth.

In the absence of the opportunistic diseases required by the current case definition, a histologically confirmed diagnosis of chronic lymphoid interstitial pneumonitis in a child (under 13 years of age) will be considered indicative of AIDS unless test(s) for HIV are negative.

Specific conditions that must be excluded in a child are:

(1) Primary immunodeficiency diseases: Severe combined immunodeficiency, DiGeorge Syndrome, Wiskott-Aldrich Syndrome, ataxia-telangiectasia, graft-versus host disease, neutropenia, neutrophil function abnormalities, agammaglobulinemia, or hypogammaglobulinemia with raised IgM.

(2) Secondary immunodeficiency associated with immunosuppressive therapy, lymphoreticular malignancy or starvation.

From MMWR: 32:691, 1983
MMWR: 34:373, 1985

TABLE II
HIV-Associated Presentations in Children

1. Nonspecific Physical Findings (Hepatomegaly, splenomegaly, lymphadenopathy, failure to thrive, fever of unknown etiology, etc.) See Table III.
2. Lymphocytic Interstitial Pneumonitis
3. Recurrent or Persistent Infections (bacterial sepsis, meningitis or otitis media, *Pneumocystis carinii* pneumonia, oral candidiasis, and diffuse infections with cytomegalovirus, Epstein-Barr virus, Herpes simplex and *Mycobacterium avium-intracellulare* complex).
4. Neurologic Deterioration
5. Autoimmune thrombocytopenia and neutropenia
6. Protein-Calorie Malnutrition
7. Acute Retroviral Syndrome
8. Certain Hematologic Malignancies
9. No Clinical Manifestations

TABLE III
Associated Findings in Pediatric HIV-Associated Disease

Finding	*Percent of Reported Cases*°
Hepatomegaly	90
Splenomegaly	81
Failure to Thrive/Weight Loss	80
Lymphadenopathy	70
Fever of Unknown Etiology	64
Oral Candidiasis	60
Interstitial Pneumonitis	56
Dermatologic Manifestations	52
Neurologic Deterioration	44
Recurrent Otitis Media	44
Chronic or Recurring Diarrhea	32
Parotitis	24
Neoplasms including Kaposi's Sarcoma	8
Also:	
Severe or Recurrent Bacterial Infections	59
Opportunistic Infections	49

° In published series of children with symptomatic HIV infections

diseases have a history of recurrent or persistent infections, including bacterial sepsis, meningitis and otitis media. Other infectious agents include *Pneumocystis carinii* pneumonia (until recently the only reportable group), oral candidiasis, Cytomegalovirus, Epstein Barr virus, Herpes simplex and *Mycobacterium avium-intracellulare* complex.[1-5, 7, 8]

(d) Some children with HIV-associated diseases have presented with progressive, unexplained neurologic deterioration, a progressive encephalopathy characterized by late onset, unexplained seizures, loss of developmental milestones, cessation of brain growth with microcephaly and diffuse severe encephalopathy.[1-8]

(e) HIV can present with thrombocytopenia or neutropenia, either on an autoimmune or an unexplained basis. The extent of other autoimmune diseases is uncertain.[6, 7, 12]

(f) Rarely, children with HIV infections have been described as presenting with only progressive protein-calorie malnutrition.

(g) A few children with transfusion-associated HIV infections have presented with an explosive, acute "retroviral syndrome" in the immediate post-transfusion period, as has been reported in adults.[6, 9, 10]

(h) It appears that a small number of children infected with HIV will present with hematologic malignancies, including leukemias and lymphomas, though Kaposi's sarcoma appears rare in children.[7, 13]

(i) In series which report the outcomes of exposures to common-source infections (i.e. infants of infected mothers or all infants exposed to an infected blood unit) it appears that at least 20 percent of children with HIV infections will remain asymptomatic for at least a few years after infection[6, (Frank T. Saulsbury, personal communication)]. It is probable that this percentage greatly underestimates the number of currently infected children who have no clinical signs of disease.

Suggestive laboratory findings in HIV infections in children include almost universally described anemia, altered mononuclear cell function studies, hypergammaglobulinemia, altered T-cell subset ratios, and, less commonly, thrombocytopenia. Leukopenia is rarely reported in children with HIV infections.

DIAGNOSIS

The two most important tools in the diagnosis of pediatric HIV-associated disease are a high index of suspicion and a complete epidemiologic investigation.

Children with the previously mentioned unexplained physical or laboratory findings should be considered candidates for evaluation for HIV-associated diseases, as should children of parents in high risk groups.

If a child is considered to have a risk for HIV infection, further evaluation is mandatory. In addition to the tests necessary to rule out other immunodeficiency syndromes, the most important test to run is an HIV antibody assay by ELISA, a test available through many private and all state-run laboratorics. A positive ELISA test must be confirmed by a Western Blot Analysis or by viral isolation studies, as should a negative HIV ELISA in the face of a strongly suggestive clinical picture.

Other tests, including T-cell subset ratios, quantitative immunoglobulins, etc., while suggestive, are not necessary nor sufficient for the diagnosis of HIV infection, and should be included only for epidemiologic information or to monitor disease development.

MANAGEMENT

If a child with an HIV-associated disease is acutely ill, immediate medical management, directed at the acute pathologic process, should, of course, be instituted immediately.

Assuming that the child is not acutely ill, however, some important decisions should be made. If at all possible and reasonable, the child and his or her family should be treated at the regional center with the most experience in dealing with HIV-associated diseases, especially those diseases in children. Such a referral offers the patient more experienced, and often more accepting, staff support and offers the medical community the opportunity to develop a sufficiently large clinical experience with HIV-associated diseases in children to allow for timely advances in the treatment of such diseases. Such referrals should not, of course, ever occur solely to allow a hospital to avoid a potentially "troublesome" patient.

Where such a referral center is not immediately available, or during the time that the child is being prepared for transfer, the clinician should provide the child with intense oral nutritional support, early diagnosis and treatment of any infectious diseases, and prophylactic Trimethoprim-Sulfamethoxazole, if tolerated. Other suggested treatment modalities have included intravenous gamma globulin.[11] It is suggested that the clinician treating a child with HIV-associated disease maintain close telephone contact with more experienced clinicians, both regionally and nationally.

Aggressive action must also be taken to protect any child with HIV-associated disease. This includes not only protecting the child from infectious illness (and live virus vaccines) but also from possible negative public sentiment. Strict confidentiality must be maintained for all patients with HIV-associated diseases, and any action that might breech this confidentiality, on either the physician or the family's part, should be discussed at length with the family.

The public seems to have remained unaware that there is extremely limited evidence of HIV transmission due to non-sexual, casual, contact between family members, classmates, and medical care personnel caring for patients with HIV-associated diseases. Regretfully, this message has not yet disseminated as widely as the degree of public awareness of AIDS itself.

With a very few precautions, the neurologically and mentally normal child with HIV-associated disease should be encouraged to engage in normal, age-appropriate activities with minimal interference.[14]

Precautions should include instructions to older children to refrain from the exchange of body fluids (including blood, saliva and semen). They should also include instructions to parents and older children in appropriate cleaning techniques (with 10 percent ammonia solutions) for surfaces contaminated with body fluids. Younger children should be monitored for theoretically dangerous practices, especially the biting of other children. Most importantly, these children and their parents should be taught to avoid other children with potentially communicable diseases.

Finally, parents of children with HIV-associated diseases, and, where appropriate, the children themselves, should be told honestly and frequently that the ultimate outcome for children with HIV infections is currently unknown, and that the full spectrum of outcomes for these children has not yet been defined. □

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AIR FORCE



SCMA NEWSLETTER

NOVEMBER 1986

SOUTH CAROLINA PRO

The PRO plans to begin preadmission review of Medicare patients with the following diagnoses: permanent pacemakers, cholecystectomies, lens extractions, hip/knee replacements, TURP's and cardiac catheterization. The implementation date has not yet been determined.

It is important that physicians who admit these types of Medicare patients be familiar with the PRO's criteria, administrative procedures and documentation requirements. If you have not yet received a copy of this PRO information, please contact:

Metrolina Peer Review Medical Foundation Inc.
1 Charlottetown Center, Suite 150
Charlotte, North Carolina 28204
704-373-1545

Hospital administrators and chiefs of staff have received copies.

Also available are the PRO's generic quality screening criteria and its criteria for non-MD screening of the need for inhospital admission. Physicians with concerns or comments about these criteria should write the PRO (Metrolina Medical Foundation), their hospital chief of staff, the South Carolina Chapter of their specialty society and the South Carolina Medical Association.

Of other note will be the PRO's review of all one and two day stays for Medicare. The inpatient admission of patients who stay less than 24 hours will generally be denied. Physicians are cautioned to avoid terminology such as "admit patient for observation" and to thoroughly document the failure of outpatient treatment, the patient's history which necessitates admission, and any other pertinent findings which support the need for hospital admission.

PRO MONITORING PROJECT

The American Medical Association is once again urging physicians to relay their experiences with Peer Review Organizations. The PRO Monitoring Project is part of an ongoing AMA activity to keep apprised of developments in the implementation of the federal government's PRO program. Both positive and negative comments are welcomed, and all sources of information are confidential. If interested, please send a brief letter describing your experience(s) to the SCMA. National concerns will be forwarded to the AMA.

Within the next week, the SCMA will notify hospitals that, upon request, we will provide objective physician review of any PRO-issued denial with which the attending physician and a physician reviewer representing the hospital disagreed.

MEDICARE PHYSICIAN PAYMENT AND FEES

As a reminder, physicians will be given the opportunity to change their 1987 Medicare participating or non-participating status. At the time this newsletter went to print, Medicare had not declared a deadline for electing this status. Please be aware that the deadline could be as early as December 15 or as late as December 31, 1986. It is advisable to elect your option now so as not to risk missing the deadline once it is set.

For fee screen years beginning on January 1, 1987, prevailing charges for non-participating physicians will be set at 96% of the prevailing charge levels allowed participating physicians.

Both participating and non-participating physicians will receive an equal 3.2% update in the Medicare prevailing charge beginning January 1, 1987.

The current freeze on actual charges of non-participating physicians will expire on December 31, 1986, and be replaced by the following system of charge limitations effective January 1, 1987.

If the physician's actual charge for any given service is AT OR ABOVE 115% of the prevailing charge, his actual charge for that service may not be increased more than 1%.

If the physician's actual charge is LESS THAN 115% of the prevailing charge, the actual charge may be increased as follows:

January 1, 1987: charge increases are limited to 1/4th of the difference between the actual charge and 115% of the Medicare prevailing charge.

January 1, 1988: charge increases are limited to 1/3rd of the difference between the actual charge and 115% of the Medicare prevailing charge.

January 1, 1989: charge increases are limited to 1/2 of the difference between the actual charge and 115% of the Medicare prevailing charge.

January 1, 1990: the actual charge may be increased the remaining amount necessary to reach 115% of the Medicare prevailing charge.

If you need information on these rates in making your decision as whether or not to participate, please contact:

Professional Reimbursement Department
Medicare
Blue Cross and Blue Shield of South Carolina
I-20 East
Columbia, SC 29219

Medicare carriers are required to provide each non-participating physician, at the beginning of each year, with a list of his or her maximum allowable actual changes for the year.

The Department of Health and Human Services is to impose sanctions against non-participating physicians who knowingly and willingly bill beneficiaries an amount exceeding the maximum allowable actual charge.

Another change of importance is appeals of Part B claims beyond the carrier's hearing officer have been authorized.

MEDICAID EXPANDS OVER-THE-COUNTER COVERAGE

The Medicaid program has expanded its over-the-counter drug coverage to include selected antacids, anti-diarrheals, antihistamines, dermatologicals, iron supplements, laxatives and ophthalmics. Most of these added drugs are also covered for patients residing in long-term care facilities. Additional OTC's such as vitamins and cough/cold preparations will be covered for these Medicaid recipients, patients with end-stage renal disease and crippled children recipients.

All OTC's require a doctor's prescription and are priced at comprehensive generic prices. Most higher cost brand OTC's are not covered; however, a generic drug will usually be dispensed. A recipient co-payment is not required. An explanation of Medicaid's complete drug coverage is being mailed to Medicaid recipients this month along with their Medicaid I. D. cards.

NEW ADDRESS FOR MEDICAID CLAIMS

The Health and Human Services Finance Commission has relocated its computer services for Medicaid claims to an independent contractor. The new mailing address is P. O. Box 1412, Columbia, SC 29202-1412.

SOCIAL SECURITY DISABILITY

South Carolina physicians who participate in providing exams or medical reports for Social Security Disability may direct questions and suggestions to Barbara Whittaker, Executive Director of the SCMA. Ms. Whittaker welcomes your input on behalf of the SCMA's Liaison Committee with the South Carolina Department of Vocational Rehabilitation, Disability Determination Division.

GREAT AMERICAN SMOKEOUT

The 10th Annual Great American Smokeout is scheduled for Thursday, November 20. Last year, an estimated 23 million smokers tried to quit smoking, and a Gallup Survey indicated that about seven million persons stopped smoking for at least 24 hours. Physicians can play a big role by encouraging their patients to stop smoking. A previous Gallup Survey revealed that 71% of patients who smoke one or more packs a day would quit if their physicians told them to do so and that younger smokers were more likely to accept their physician's advice than older ones. Please call the American Cancer Society for "Survival Kits", pads, posters, buttons and stickers to distribute to your patients during the Great American Smokeout.

S.C. ACADEMY OF FAMILY PHYSICIANS ANNUAL SCIENTIFIC ASSEMBLY

The South Carolina Academy of Family Physicians is holding its 38th Annual Scientific Assembly December 3 through December 6 at the Hyatt Regency on Hilton Head Island. For additional information or a registration form, please contact:

South Carolina Academy of Family Physicians
P. O. Box 771
Mauldin, SC 29662
(803) 288-6647

USC DRUG INFORMATION SERVICE

The University of South Carolina Drug Information Service is available for all health care practitioners in the state. The service is located in Room 207 of the Medical Library. Funded by the College of Pharmacy, clinically oriented drug information is provided Monday through Friday, 7:30 a.m. to 4:00 p.m., at no charge. Information on drug therapy, adverse reactions, drug identification and availability may be inquired about by calling 803-733-3170.

LUNG ASSOCIATION'S SPEAKER'S BUREAU

The American Lung Association of South Carolina has established a speaker's bureau for organizations, groups, seminars, school functions and others on topics of lung diseases and the Lung Association.

CAPSULES...

Hunter R. Stokes, M.D., of Florence, was named vice chairman of the newly formed National OPHTHPAC Board of the American Academy of Ophthalmology.

Robert H. Taylor, M.D., of Spartanburg, was installed as president of the American Academy of Family Physicians at the recent Congress of Delegates meeting.

ENDOSCOPIC PALLIATION FOR JAUNDICE ASSOCIATED WITH MALIGNANT BILIARY OBSTRUCTION

JOHN T. CUNNINGHAM, M.D.*

Despite improvement in diagnostic modalities, the five-year survival for most malignancies producing obstruction of the biliary tree is not improving and continues to be poor. With the exception of carcinoma of the ampulla of vater, survival is in the three to eight percent range at five years. Therefore, the main goal is frequently palliation, either by surgical bilioenteric anastomoses, or by internal or external percutaneous radiographic drainage. However, disadvantages exist for both methods. Endoscopic retrograde cholangiopancreatography (ERCP) now offers a technique by which polyethylene tubes can be inserted, via the endoscope, through obstructing lesions to restore biliary flow into the duodenum. In patients with incurable disease, the major goals of therapy should be an efficient, cost effective reduction in symptoms and improvement in the quality of patients' lives.

METHODS

Recent advances in flexible fiberoptic endoscopic techniques have resulted in the ability to place indwelling prostheses across malignant obstructing lesions with a high degree of success. This technique requires one of the side viewing endoscopes with a 3.7-4.2 mm operating channel through which one can insert 9.6-11.6 Fr endoprostheses. First the lower common bile duct is cannulated with a regular diagnostic catheter followed by the retrograde advancement of a soft, flexible tip guidewire (Fig. 1) through the obstructing lesion. Then the diagnostic catheter is slid over the wire above the stricture. The guidewire is then removed and additional contrast injected to determine the length and course of the stricture (Fig. 2). The guidewire is reinserted to stiffen the system, and the prosthesis is then slid over the guidewire/catheter system. Using combined endoscopic and radiographic control to establish proper position across the obstruction, the guidewire/catheter is then withdrawn leaving the prosthesis in place and visual (Fig. 3) and fluoroscopic patency is documented (Fig. 4).

Case #1: A 40-year-old male presented with a five-day history of aching RUQ pain, pruritis, dark urine and clay-colored stools. On physical



FIGURE 1: Radiographic view of the common bile duct in a patient who has complete obstruction of the common hepatic duct with an endoscopically placed guidewire extending through the stricture (arrows).

* Department of Medicine, Medical University of South Carolina, 171 Ashley Avenue, Charleston, S. C. 29425.



FIGURE 2: Injection of contrast reveals dilated ducts above the obstruction.



FIGURE 3: Delayed film with the endoprosthesis in place, drainage of dye into the small bowel, with some residual contrast in the gallbladder.

exam, a 10 cm. tender liver and icteric sclerae were noted. Ultrasound revealed dilated intrahepatic ducts, but no discernible masses. At ERCP a 1.5 cm. compression of the common hepatic duct compatible with either primary cholangiocarcinoma or compression from nodes in the porta hepatis was noted. A five french nasobiliary stent was placed to provide preoperative decompression with bilirubin levels falling from 10 mgm.% to 4.2 mgm.%. Exploratory laparotomy revealed disseminated peritoneal carcinomatosis, a firm, enlarged pancreas, and nodal compression at the hilum. Biopsies were most compatible with adenocarcinoma of pancreatic origin. Due to the high level of the obstruction, a surgical bypass could not be performed. Post-operative radiation to the porta hepatis failed to reduce the common hepatic duct stricture. Therefore, for patient comfort, the nasobiliary drain was removed and an indwelling stent (7 Fr) was inserted endoscopically (Fig. 4). The patient survived for an additional 118 days with no further evidence of cholestasis or cholangitis. He expired at home from disseminated malignancy.

Case #2: A 67-year-old male presented with a six-month history of diarrhea, 30-lb. weight loss and progressive weakness. One month earlier dark urine and scleral icterus were noted. A CT scan at another hospital revealed a 4 cm. mass in the head of the pancreas, encasement of the portal vein, and a dilated common bile duct. At ERCP both the pancreatic duct and common bile duct were obstructed in a pattern which is highly suspicious for adenocarcinoma of the pancreas, the so-called "double duct" sign (Fig. 6). A 10 Fr indwelling endoprosthesis was inserted with a decrease in his bilirubin from 18.2 mgm.% to 8.0 mgm.% at discharge (Fig. 5). He was readmitted one month later with increasing jaundice, ascites,



FIGURE 4: Endoscopic view of the lower end of the prosthesis with good bile flow reestablished (arrows).



FIGURE 5: Obstruction of both the pancreatic (small arrows) and distal common bile duct (large arrows) in a patient with pancreatic adenocarcinoma (double duct sign).



FIGURE 6: Larger 10 Fr endoprosthesis positioned across the stricture with free flow of contrast into the duodenum.

and mental confusion. His stent was patent and the jaundice was secondary to extensive hepatic metastasis. The patient died one week later of progressive hepatic failure. Postmortem examination confirmed his extensive malignancy and the stent was patent.

DISCUSSION

The management of patients with malignant biliary obstruction can be highly variable depending upon the nature and location of the tumor. More recent diagnostic modalities including arteriography, ultrasonography, and CT scanning combined with skinny needle aspiration have increased the ability to preoperatively diagnose and stage patients with malignant obstruction.[1] From this point, the role of the physician is first to determine if the patient is a surgical candidate, and if so, is the proposed surgery for cure or for palliation. If curative resection is not possible, then the best approach is to provide the patient relief of his symptoms while maintaining the best quality for the patient's remaining life. Major pancreatic resection for palliation has lost favor to less invasive methods. Nonoperative biliary

drainage has been available for the past five to eight years. Percutaneous transhepatic drainage can provide effective decompression, but has a high incidence of complications; especially sepsis.[2] Patient acceptance is low, and intravascular volume depletion and electrolyte problems are common, especially if drainage is external. Internal drainage with return of the bile steam into the small bowel is preferred, but x-ray placement succeeds less commonly than the endoscopic approach, and peri-catheter infections are common[3] and replacement difficult.

Endoscopic insertion of internal stents has been available for three to five years, and placement succeeds in 70 to 90 percent of cases. The duration of stent function is variable; but seems to be improved by a relatively straight shape and a larger internal diameter of the tubing.[4] The major complication encountered is occlusion of the stent with biliary crystal debris which is commonly followed by cholangitis. Repeat ERCP with stent replacement can be carried out in such cases with low morbidity and mortality.[5]

The exact role of therapeutic endoscopy in the management of the patient with malignant obstruction is still being resolved. Obstructed patients with adenocarcinoma of the pancreas, whom, after preoperative evaluation, still appear to be potentially resectable, should receive the benefit of surgery. In these patients there is still some considerable controversy over whether preoperative biliary drainage offers any benefit over proceeding directly to surgery. Several series suggest no benefit with percutaneous transhepatic drainage;[6] however, to date, no prospective endoscopic series have been reported. The fit surgical candidate who is unable to have a resection for cure presents another issue, but again no prospective data are available to define whether survival with palliative surgical bypass is different from endoscopic stenting.

The elderly or more debilitated patient presents a less controversial issue. These patients clearly have more advanced disease with a high surgical morbidity and mortality. This group, in particular, may benefit from endoscopic palliation, which in practiced hands, carries a low complication rate with a high degree of patient acceptance. The mean survival for these patients is about six months, which usually means only one prosthesis change at the most, as the usual life of a 10 Fr prosthesis is about 32 weeks.

The approach to ampullary neoplasms is more encouraging as this lesion has a high rate of resectability (25 to 40 percent), and a slower rate of progression. Survivals of two to three years are not unusual. Therefore stenting, though relatively simple to perform, may have to be repeated on numerous occasions. This may make one consider surgical palliation in a more favorable light.

Cholangiocarcinoma, and particularly those involving the upper one-third of the biliary tree, are unresectable in 80 percent of the cases. Surgical palliation requires extensive expertise and has a high morbidity. Therefore, the majority of the patients receive percutaneous or endoscopic palliation. Unfortunately, this situation is more difficult to manage, as multiple ducts may be strictured making effective decompression with a single prosthesis less likely to be achieved. Cholangitis is a common problem and usually occurs in undrained segments. Therapy must include antibiotics and drainage, as recurrent infection occurs if the latter is not accomplished.

Endoscopic insertion of biliary prostheses is a relatively new technique which can be accomplished by the experienced endoscopist in 90 percent of pancreatic lesions, 80 to 90 percent of cholangiocarcinomas below the bifurcation of the common hepatic duct, and in about 50 percent of hilar tumors. The major cause of failure is duodenal stenosis which precludes adequate visualization and manipulation in the ampullary region. It is associated with a low morbidity and mortality, particularly when one realizes that it is generally used for the more elderly or debilitated patients.

Stent placement should decrease hospitalization time and attendant expense. Patients can be discharged in 48 to 72 hours after insertion if effective drainage is established. It can be performed at the time of the diagnostic ERCP, without the need for general anesthesia or a sterile operating theatre. The larger bore, straight stents have an acceptably long survival without occlusion, which will diminish the need for repeated endoscopies for replacement. Patient acceptance has been high. If properly positioned, stents cause no pain or discomfort, and cholangitis, the most common complication (eight percent), occurs only as a consequence of occlusion. This technique is rapidly becoming the method of choice for the nonoperative management of malignant biliary obstruction.[7] Its precise role remains to be

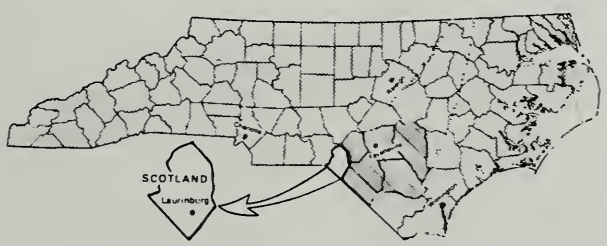
determined in the fit surgical candidate, and prospective randomized trials will be required.

SUMMARY

Endoscopic decompression offers a safe, effective method for management of patients with obstruction secondary to malignancy. It may play a role in preoperative drainage, but is better suited for palliation in the older, unresectable patient or in patients who are not deemed fit for surgery. The intent is to relieve the jaundice and pruritis, decrease cholangitis, and to restore bile flow into the duodenum in order to restore the normal digestive process. Its greatest asset is that these goals can be accomplished with significantly lower morbidity than that of either surgical bypass or percutaneous decompression with reduced hospital time and cost. □

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THE PLEURO-PERITONEAL SHUNT FOR INTRACTABLE PLEURAL EFFUSION: A CASE REPORT*

WILLIAM H. PRIOLEAU, JR., M.D.**
L. DIETER VOEGELE, M.D.
W. T. DAWSON, JR., M.D.
CHARLES C. GEER, M.D.
PETER HAIRSTON, M.D.

Intractable aseptic pleural effusion is customarily managed by repeated thoracentesis. Repeated thoracentesis, however, has its limitations: frequent hospital or office visits, discomfort of the procedure, and recurrence of dyspnea in the days or hours preceding each thoracentesis. An alternative way to manage a patient with recurrent effusion is to implant a pleuro-peritoneal shunt.[1, 2, 3]

The pleuro-peritoneal shunt*** consists of a proximal pleural catheter, a flexible pump chamber containing two valves, and a distal peritoneal catheter (Fig. 1). The valves open at a difference of pressure between the two body cavities of one centimeter of water and readily close when peritoneal pressure exceeds that in the pleural space. The entire device is made of silicone rubber. Each compression of the pump delivers 1.5 ml and it is recommended that the pump mechanism be compressed at frequent intervals through the day.

CASE REPORT

An 80-year-old white female was referred for left-sided pleural effusion. She had undergone a right upper lobectomy for adenocarcinoma of the lung nine years previously and had done well until recent months, when she developed dyspnea and hoarseness. An x-ray showed enlargement of the hilum of the right lung and a pleural effusion on the left side containing adenocarcinoma cells.

Repeated thoracenteses became necessary with the interval between thoracenteses decreasing to ten days. At each procedure, 1500 ml of clear fluid was removed.

A pleuro-peritoneal shunt was implanted. The chest catheter was placed through the left fifth interspace and the pump was placed in a subcutaneous pocket on the left anterior chest wall. The peritoneal catheter was located in the left upper quadrant of the abdomen. The procedure was performed without difficulty under local anesthesia.

Following operation, the patient and the nursing service were instructed to compress the pump multiple times each hour during the day. It was soon apparent that this was impractical. In this elderly, debilitated patient, the tissues overlying



FIGURE 1: Pleuro-peritoneal shunt with thoracic catheter, flexible pump chamber and peritoneal catheter.

* From Roper Hospital, Charleston, S. C.
** Address correspondence to Dr. Prioleau at Commercial Suite One, Ashley House, Lockwood Blvd., Charleston, S. C. 29401.
*** Denver Biomaterials, Inc.

the pump became inflamed. Because of inflammation, activation of the pump was stopped for several days, and after that activation of the pump was resumed only on a limited basis. For this elderly lady, compressing the pump caused discomfort even when the wound was well-healed.

Despite the fact that active compressions of the pump were minimal, this patient experienced relief from dyspnea and coughing spells, and continued to do her housework until she became terminal some eight weeks after operation. During this time of symptomatic improvement, x-rays (Fig. 2) showed a clear left upper lung field, but persistence of an effusion at the left base. An attempt at thoracentesis was unsuccessful six weeks after the implant. Ten weeks after the implant, 800 ml. of fluid was aspirated with difficulty from the left base. The patient died twelve weeks after the implant. An autopsy was not obtained.



FIGURE 2: X-ray shows right hilar enlargement, a persistent effusion at the left lung base, and the catheter of the shunt in the left upper pleural space.

DISCUSSION

During the ten weeks following the implant of the shunt, the patient experienced relief from respiratory distress and coughing spells despite the fact that active compressions of the pump chamber were almost certainly inadequate to propel a significant amount of fluid. A subpulmonic collection of fluid appeared to remain about the same size from the time of operation until death. The evidence suggests that fluid in excess of the collection at the base of the left lung was removed by the catheter.

The propulsion of fluid through the shunt in the absence of active compressions of the pump was probably promoted by the activity of the patient until she became terminal and the production of fluid by tumor cells which increased the intrapleural pressure.

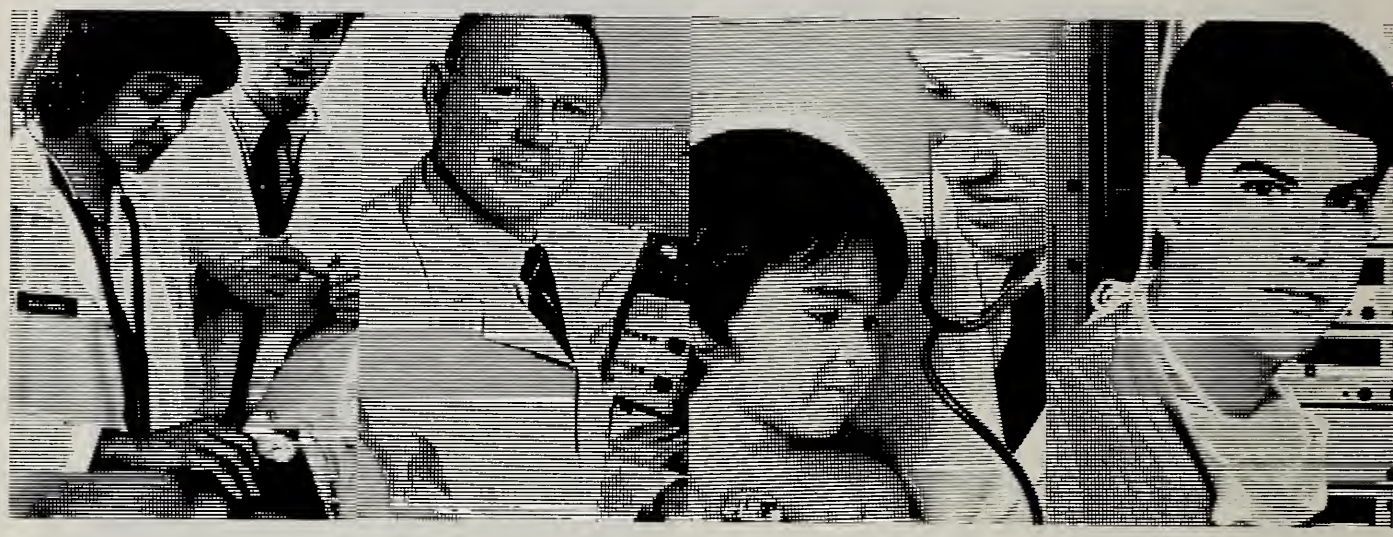
No cases have been reported thus far of disseminated tumor in the peritoneal cavity in patients who have had a shunt implanted in the presence of malignant disease in the chest. To date, however, experience with the device is limited, and the risk of disseminating tumor is not known. Certainly these factors must be considered in each situation.

The pleuro-peritoneal shunt may provide satisfactory palliation for intractable pleural effusion. □

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FINANCIAL CHECKUP

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Vol. 6, Issue No. 11 November 1986

IS TAX-FREE INCOME IN JEOPARDY?

Proposed tax legislation is confusing to both investors and issuers.

When the House passed its version of the federal income tax reform bill, it placed millions of municipal bond investors and issuers in a major quandary. Since provisions calling for restrictions in municipal bond market activity are effective January 1, 1986, the bill carries the same impact as if it were actually law. The immediate effects will be a reduction in new issue supply and increase in the value of existing bonds.

New Issue Blues

The House tax bill in its present form will severly restrict a broad area of municipal financing, affecting both the issuer and the investor. For instance, the bill will prohibit or place under new volume caps, all tax-exempt bonds sold for private purposes. These would include such bonds as certain commercial and industrial projects, student loans, water and solid waste projects and non-profit organizations. And when state and local governments lose the ability to offer tax-free income at attractive rates, they lose the inexpensive capital needed to finance economic development. Additionally, the bill would limit the ability of state and local governments to prepay outstanding obligations, preventing them from taking advantage of a drop in interest rates to lower their overall borrowing costs.

What Would This Mean To Consumers?

Additional borrowing costs incurred by state and local governments - as much as 30% by 1990 - would be passed on to you, as a citizen, through increases in local taxes, utility bills and user fees along with reductions in services. And as an investor, you may have to look elsewhere for a tax-free alternative.

From an investor's standpoint, another serious consideration is the 25% alternative minimum tax (see below*) that would include, on income calculations, interest paid on certain types of municipals issued after 1985. These would include bonds for housing, hospitals, mass commuting facilities, industrial development, solid waste and many water and sewer projects.

Many view this proposal as a foot in the door by the federal government to expand taxes on other types of municipal bonds. In fact, the question of any taxation on municipal bonds puts the "doctrine of reciprocal immunity" - a Supreme Court ruling in which the federal government does not tax the interest on municipal bonds and local governments don't tax the interest on Treasury bonds - in serious jeopardy. Disbelievers may be surprised to discover that a last minute amendment to the tax package requires investors to report for "information purposes" the amount of municipal bond interest they receive beginning with the 1986 tax year.

The Silver Lining.

Even with the number of changes instituted by the House bill, the opportunities available to the municipal investor still abound. The restrictions placed on tax-exempt bonds would reduce volume by 30 to 40 percent of 1984's volume and up to 50 percent of those bonds issued in 1985. And as the demand for tax-free investments far exceeds supply, the price of existing holdings should rise.

If you were one of the many investors who participated in last quarter's bond market, when issuers rushed to beat the December 31st deadline, 1986 may be your year for capital gains (should you decide to sell) or, you may want to hold on to your bonds and continue to enjoy your tax-free bond income. On the other hand, if you didn't take advantage of 1985's record high volume and relatively low prices, you may want to act now since long term municipal bond rates are expected to trend lower this year.

Although another provision of the tax reform bill calls for a cut in personal income tax rates, more people will be paying federal income taxes at the top rates of 35% and 38%, keeping municipal bonds attractive to the same people who have been buying them all along. For taxpayers in these brackets, the yields on most municipal bonds - which continue to trade at 85% - 95% of treasury yields - should still be more attractive than the after-tax equivalents of quality, taxable investments.

As a final note, if you're subject to the alternative minimum tax, you should look for bonds that were issued in 1985 since bonds issued before the effective date of January 1, 1986 will not be subject to inclusion.

*What Is The Amount?

The alternative minimum tax is a flat rate tax designed by Congress to prevent taxpayers with substantial income from avoiding tax liability by using exclusions, deductions, investment tax credits and other "tax preference" items.

If you're in the 35%+ tax bracket and have invested extensively in tax shelters, taken sizeable long-term capital gains or exercised incentive stock options issued at a substantial discount from market value you may be a candidate for the alternative minimum tax.

While the AMT is a flat 25% and therefore, appears to be less than the 50% top regular tax rate, it is, in fact more. When calculating the AMT, you must add back into your income many of the items you would normally deduct. These preference items include: *Long-term capital gains *Depreciation and depletion deductions *Energy exploration expenses *Research and development expenses *Dividend exclusions *Gains achieved from incentive stock options.

When these normally deductible items are added back into your gross income, the AMT can be significantly higher than the regular tax you would have to pay even in the 50% bracket. Consult your tax advisor for further details.

*****This newsletter was taken from the E.F. Hutton March 1986 Investment Quarterly.*****

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Editorial

IMPRESSIONS OF THE SECOND ANNUAL LEADERSHIP CONFERENCE

The SCMA's second Annual Leadership Conference, held September 17, attracted wide media attention primarily because of a featured debate between the two gubernatorial candidates: Michael R. Daniel and Carroll A. Campbell, Jr. By the time this issue of *The Journal* appears in print, one or the other will have been elected and the contents of the debate will be of historical interest only. A more lasting impression of the conference was its establishment as an annual SCMA event of major importance.

The scope of this year's conference is worth reviewing. After introductory remarks by our personable president, Walt Roberts, the morning session began with an animated panel discussion of tort reform. Senator John Courson of Richland County, co-sponsor of the bill with Senator William Doar of Georgetown, outlined this year's proposed legislation. He suggested that the SCMA should limit its lobbying efforts to this one issue, since stands on other issues might obscure our purpose. Senator Courson complimented the lobbying efforts of Susie Nickles of the SCMA staff, pointing out her exceptional attendance at the senate's chamber sessions. Our president-elect, Charlie Duncan, then outlined our specific involvement. Finally, Ms. Nickles and Edward Poliakoff, chairman of the steering committee of the South Carolina Civil Justice Coalition, outlined the need for physician involvement at the local level.

Next, Walt Roberts discussed the importance of the Federation of Medicine. These remarks were followed by a discussion of the continued need for membership recruitment to organized medicine by Mr. Terry Nugent, representing AMA headquarters in Chicago. All of these speakers emphasized the need for organized medicine to join ranks with other segments of society in pushing for needed legislation. Walt Roberts underscored this point: "*We're trying to protect the public, not ourselves.*" While the malpractice insurance crisis may be especially visible, nearly every segment of society now finds representation in the Civil Justice Coalition. It was pointed out that the trial lawyers have already raised over $300,000 "to protect what they've got" and that they will again oppose the efforts of the coalition.

At their luncheon debate, both of the gubernatorial candidates demonstrated an excellent grasp of the malpractice liability crisis. Representative Campbell felt that primary emphasis should be to bring insurance rates down, and promised to appoint a task force to address this issue. Pledging to beef up the existing State Department of Insurance as an alternative, Lieutenant Governor Daniel proposed giving the insurance commission the authority to reduce premiums when the industry's profits appeared to be excessive.

The afternoon's session began with a discussion of "do's and don'ts" of media relations, led by our public relations consultant, Chuck Luce of Resh Advertising, Inc. He emphasized that good press relations should begin with honesty and "shooting squarely" and with knowing the media people who are reacting to us. On the one hand, we must "tell the truth even when it hurts;" on the other hand, we must remember that offhand remarks (as at cocktail parties or on the golf course) may be quoted. If you don't want to have a statement quoted, don't make it!

Joseph Sullivan, president of Blue Cross and Blue Shield of South Carolina, provided an update of the Medicare program. Pointing out the tremendous uncertainties facing the program, he suggested that his task was like "asking Daniel in the lion's den to pass the salt and pepper." He indicated that physicians' fees would continue to receive the close scrutiny of Congress, and that fees might be reduced by as much as two to eight percent. All physicians should be aware that they will have the opportunity to change their status (participating or non-participating) during the

period of November 1 to December 15 of this year.

Next, Dennis Caldwell, executive director of the Health and Human Services Finance Commission, discussed progress in the administration of Medicaid funds. He praised the efforts of the SCMA Primary Care/Medicaid and Indigent Care Committee and also the efforts of individual physicians in working with this commission to resolve the many problems and complaints surrounding the Medicaid program. He felt that much progress had been made toward streamlining the program and thereby reducing paper work and inordinate delays in claims processing.

Susie Nickles then discussed health issues in which the SCMA will be involved during the 1987-1988 legislative session. These issues have been previously discussed in the July, August, September, and October issues of the "Legislative Update," and will therefore not be repeated here. We should, however, continue to emphasize the importance of physician involvement in the political process. As Walt Roberts remarked: "to say that we are above politics means that democracy is beneath us." Finally, William Mahon, our executive vice president, led an open question-and-answer session on the issues discussed during the entire day as well as other matters of interest to the audience.

The Annual Leadership Conference provides an opportunity for persons elected to various offices to become well-informed and increasingly involved in the issues confronting organized medicine. The low-key atmosphere of the conference encourages dialogue. This conference will probably evolve as an important fall meeting, nicely complementing the more business-oriented spring annual meeting. My most lasting impression continues to be the need for more physicians to become committed to the goals of organized medicine, emphasizing not our own self-interests but rather the deepest interests of society.

— CSB

LETTERS TO THE EDITOR

To the Editor:

Because of the increasing popularity of suction assisted lipectomy and because of the widespread coverage in women's magazines, I think a brief update to my article in *The Journal of the South Carolina Medical Association* in July of 1984 is indicated.

I have been doing suction assisted lipectomy for about three years and this involves an estimated 800 case areas which have been operated upon. In my series of cases the results have been good with improvement in body contours. In some cases measurements with a tape measurement around the saddle bag area of the hips have been decreased by six inches or more. Jean size has decreased by four sizes. This has proved to be a stimulus to those women who need to lose weight but are not obese.

Areas most often involved in women are the saddle bag areas of the hips, the lower abdominal wall and the double chin. In men it involves the so called "love handles," abdominal wall and gynecomastia.

Problems which we were fearful of three years ago, such as excessive blood loss, thrombophlebitis, fat embolus, postoperative infection and contour problems have not materialized. It is estimated that up to 15% of the material removed at the time of surgery is whole blood. Since we never remove more than 2,000 cc of fat at the time of surgery, blood loss would never exceed 300 cc.

The amount of fat to be removed from a given area is judgmental. Body contour surgery is a learning experience and poor postoperative results are usually due to inexperience. Suction assisted lipectomy is a happy operation — with usually good results and pleased patients.

Carter P. Maguire, M.D.
55 Bee Street
Charleston, S. C. 29403

To the Editor:

I read with interest Dr. Bessinger's article, "Carcinoma Of The Breast: When May The Breast Be Saved?" in *The Journal of the South*

Carolina Medical Association in September of 1986. It was an excellent article, precise and meaty. I feel, however, that with the impressive results that have been made in reconstructive surgery of the breast during the past ten years some mention should be made of the option of postmastectomy reconstruction. This option is usually discussed with a patient, if the case is an appropriate one, so that the plastic surgeon might be consulted prior to the mastectomy concerning the positioning of the scar and salvaging of the pectoralis major muscle if possible. On today's market this has, in many areas, become a matter of routine since most reputable health insurance companies consider it a covered benefit in their health plan.

CARTER P. MAGUIRE, M.D.
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AUXILIARY

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The SCMA Auxiliary is committed to supporting and implementing programs that are endorsed by the SCMA. Each of the county auxiliaries in South Carolina is concerned with its community and with providing solutions to health problems.

The four Regional Vice Presidents of the SCMA Auxiliary serve as liaisons between the state auxiliary and the county auxiliaries. The state auxiliary Membership Committee has set its goal of 200 new members for this year. Only with the support of our physicians will this goal become a reality. The following reports are presented to outline regional membership goals for the current year.

EASTERN REGION: **MRS. STEVEN COKER**
Eastern Regional Vice President

A new county auxiliary has just been organized — Georgetown County. The goal for 1986-87 is to increase membership in the Eastern Region by 34.

WESTERN REGION: **MRS. THOMAS C. LITTLEJOHN**
Acting Western Regional Vice President

The membership goal in the Western Region is to increase membership by at least 42 new auxilians while retaining the present membership.

CENTRAL REGION: **MRS. WILLIAM MEEHAN**
Central Regional Vice President

The Central Region also anticipates an increase of 42 new members with enthusiastic response from County Presidents. The plans of this positive thinking group are impressive. A designer Christmas Sharing Card for AMA-ERF (American Medical Association — Education and Research Foundation), a thirty year anniversary celebration of an auxiliary, combined meetings with county medical societies, political awareness seminars, ETV telethon volunteers and fund raisings, too numerous to mention, are some of the activities abounding in the Central Region.

SOUTHERN REGION: **MRS. J. MICHAEL GRAYSON**
Southern Regional Vice President

The goals in the Southern Region for 1986-87 are focused towards (a) retaining, recruiting and increasing membership, and (b) increasing the membership by 42 new members.

The five organized counties — Beaufort, Charleston, Colleton, Dorchester and Edisto-Orangeburg — have many projects that are supportive and are extensions of their medical societies. There is 100 percent participation in AMA-ERF as well as efforts to keep members informed of current legislative issues supported by the SCMA. The auxiliary projects in these counties include a museum Health Science Exhibit, blood pressure screenings, medical scholarship, Doctors' Day recognition events, and a joint meeting with all of the county medical societies.

The four regions of the SCMA Auxiliary are diligently furnishing the county auxiliaries and members-at-large with sources of information to increase services to the members as well as to the physicians. Medical societies and medical auxiliaries across South Carolina are working cooperatively to provide quality health care and good will for the cause of medicine. The overwhelming support that is provided by physicians for local medical auxiliaries and the SCMA Auxiliary is insurance for positive public opinion and for the future of the medical profession.

Respectfully submitted,
HOPE GAZES GRAYSON (MRS. J. MICHAEL)

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President's Page



REFLECTIONS ON MEDICAL EDUCATION IN SOUTH CAROLINA

Being a native-born South Carolinian, I am, like all South Carolinians, happy to see us turn out a good product. If you want to see what I am talking about, take a look at today's medical student and recent medical graduates of our state's two medical schools.

My training at MUSC, and my involvement through the Clinical Teaching Faculty with the USC School of Medicine, have led me to have interest in and affection for both schools. The physician they are turning out gives me increasingly more pride in each.

As you will surely recall, many physicians and other South Carolinians had some misgivings in the mid-1970s when the "second medical school" opened. For a period there were indeed some segments of the public who felt — who perhaps still feel — that to begin a second school was a bad idea. Now, with both schools successfully functioning, most of such talk has died down, most physicians and other citizens convinced the move was a desirable one. There is now excellent dialogue between the administrations and faculties of the schools, and the state as a whole is benefiting by a continuing supply of well trained, capable physicians.

A couple of points should be made: first, I really dislike using the term "glut," but each day we are closely approaching a "saturation point" in numbers of physicians in certain training disciplines. The proliferation nationwide of medical schools during the '60s and '70s, and the increased numbers of foreign medical graduates coming to and returning to this country have produced this level of "saturation," and both problems need to be and are being addressed. It is well to observe that flooding the market with physicians improves neither the cost nor the quality of medical care. Medical care *cannot* be equated to hamburger stands. In our own state, it is agreed by those looking at the physician population that around two hundred medical school graduates a year will fulfill our needs, and our two medical schools are planning appropriately for such a number.

Second, the financial constraints of government during this period of great deficits have thrust medical school faculties more and more into the marketplace, competing for patients. Particularly in the communities where the schools are located is this competition visible and growing. It is my feeling that discussion and continuing dialogue towards solutions work better than recriminations harbored by either the practicing private practitioner or the university professor who has been increasingly called upon to help his department prosper by seeing private patients. In encouraging that dialogue, the faculties of both medical schools should be members of and active in their local, state and national medical associations. That too few of them now participate is very clear.

Finally, let me encourage you to be a contributor to our medical schools. There are at both institutions alumni organizations and capital fund drives. Plan to support both with your participation and your money. Involvement by the total physician population of the state will strengthen and sustain our medical universities, allowing them to continue their research, service and training programs, and allowing physicians of our state to have teaching institutions to which we can point with pride.

Walt Roberts

— Walter J. Roberts, Jr., M.D., *President*

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THE JOURNAL
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MEDICAL PRACTICE AND THE HMO

JOHN A. GASTRIGHT, M.D.*

The penetration of health maintenance organizations into South Carolina this past year was reminiscent of General Sherman's rapid march to the sea. While a small amount of prepaid activity existed in Greenville within the past decade, the remainder of the state was devoid of the concept until the extraordinary enrollment during the past twelve months. The extent of this rapid change in the health care environment has caused anxiety among physicians not accustomed to the concept.

The concept is certainly not new. Health maintenance organizations beginnings date back to 1929 when Drs. Ross and Loos developed the first prototype in Los Angeles, California. Over the ensuing years, development of the HMO was slow but steady and primarily concentrated in the west coast region. The growth curve took a dramatic leap in the 1970's when there was a phenomenal increase in the number of persons enrolled in the health maintenance organizations. Presently, twenty-one million Americans receive their health care through an HMO in virtually every state in the union.

The HMO has not changed since its early history. What contributed to its monumental growth in the 1970's was, in fact, due to a change in the nation's health care financial environment. Due to escalating costs, the fee-for-service and associated indemnity insurance premiums skyrocketed. In the early 1980's, the premiums for indemnity insurance finally equaled or exceeded that of prepaid health care plans. Consumers of the health care industry were then presented a dramatic choice. On the one hand, they could continue traditional fee-for-service health care, now fraught with high co-payments, deductibles, and little provision for ambulatory health care. On the other hand, for the same price, they could enroll in a health maintenance organization with virtually comprehensive coverage. It was finance that spurred the success of the HMO! Dr. Paul Elwood, formerly with the Interstudy Group, has been the sage of the HMO for the past two decades. Previously, he predicted that due to rising health care costs, the HMO would ultimately encompass 15 percent of the population. Now this number is having to be adjusted almost annually so that present conservative estimates are that 25 percent of the population will enroll in a prepaid plan before the end of this decade. In reality then, participation in an HMO is a must in order to protect the market share of the physician.

There are different descriptions applied to HMO's and various ways in which they are categorized. Some are referred to as "staff models," namely, the physicians are salaried and employed directly by the HMO. Others are called "group models" where a multispeciality group practice has a contract with the HMO but continues to provide fee-for-service care. Finally, there is the most recent success, the "independent practice association" or IPA. This latter entity has brought the HMO within the grasp of every practitioner and enables him to continue to practice in his own office structure while contracting with the HMO for a segment of its population. It is the best of both worlds for the solo practitioner or small group practice.

* Medical Director, Pee Dee Region, Companion Health Care, 506 West Cheves Street, Florence, S. C. 29501.

One wonders, when looking at the success of the HMO, what the basic principle is that enables prepaid plans to do what fee-for-service has been unable to do, namely, control costs. The principle is simple and is the crux of the entire HMO concept. The principle is to place the provider at risk. In the fee-for-service environment, the insurance company or the employer if he is self-insured, bears all the risks. The provider assumes none of the risks and as such, has very little sensitivity to concerns of costs of health care. Not so in the HMO. The HMO must place that provider at risk. In the case of the physician who is a provider within the HMO, a system will be devised where the physician will bear some of the financial risks in rendering care to his patients.

An analysis of the premium dollar helps to elucidate the mechanism by which the physician can, in fact, be placed at risk. Looking at the premium dollar, i.e., the amount the patient pays for his health insurance, and dissecting out where that funding is distributed, one can appreciate the apportionment of those resources (See Figure 1). Necessary for the continuing success of any entity is that it must have profit, or in the case of a non-profit organization, a surplus for future investment. Approximately 10 percent of the premium dollar is thus allocated towards the profitability segment. The HMO, as with all insurance entities, needs a large contingent of administrative services, such as claims processing, enrollment procedures, marketing activities, and provider support. These services are costly and consume approximately 15 percent of the premium dollar. By far, the largest portion of the health care dollar goes toward purchased services. Purchased services are here defined as those activities the physician orders, yet does not provide directly. The major portion of the purchased services goes towards hospitalization. Later in this discussion, it will be shown that this is an area of intense importance to the physician practicing within the HMO environment and his control of these purchases is crucial to financial success. Other purchased services, depending on the structure of the HMO, will include diagnostic laboratory and x-ray procedures, physical therapy, emergency room visits, home health care, specialty referrals and the like. Finally, the remaining 15 percent of the premium dollar is allocated to physician services. It is interesting that this is a relatively small percentage of the total dollar, yet it is the physician who directs

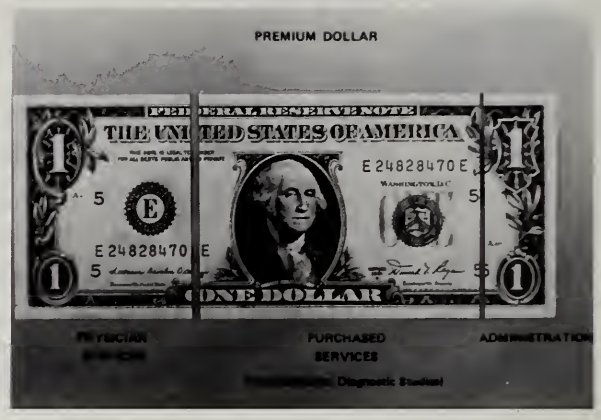


FIGURE 1.

all of the expenditures, a fact little appreciated by physicians but well-known to the rest of the health care industry.

How then is the physician reimbursed for his portion of the premium dollar? Payment in the HMO to the physician is made by capitation. This concept does not have a counterpart in the familiar fee-for-service experience. Because of this, physicians are distrustful and anxious about this approach to payment. However, it is critical to the success of the HMO and is the mechanism by which the physician can be placed at risk. Simply stated, captitation is payment to the physician based on the number of members enrolled and assigned under his name on a monthly basis. For example, if Dr. Jones has enrolled under him 500 patients in the HMO at an average per patient capitation of $12 per month, then he will receive a fixed monthly payment of $6,000 to manage the health care of his HMO population. This payment is made to him based on the number of members enrolled, not on services rendered. (Please read that sentence twice before proceeding.)

A common experience when the physician newly participates in the HMO is that after the first month, he will call the medical director in a panic and state that he saw this month ten HMO patients for complete physicals for which he normally charges $65 each. Thus, on a fee-for-service basis, the physician would receive $650; however, the HMO payment for those ten patients at $12 per patient was $120, leaving a net loss of $530. Again, it is a learning process of separating services from payment. Those ten HMO patients probably will not return for another comprehensive physical for one to five years, depending on age. Furthermore, there were 490 HMO patients

enrolled under his name that did not present for exams that month. Admittedly, however, there would be a concern that the capitation payment might not be adequate to cover the physician's cost of managing that care.

Capitation payments are based on actuaries. This is not anything new; the insurance companies have, for years, estimated their premiums based on actuarial data in the geographic region. The Department of Health and Human Services is currently computing the AAPPC for Medicare reimbursement based on these same actuaries. These data generate on a regional basis of anticipated costs of rendering care. The capitation payment is likewise linked to these actuarial data and can be trusted to be adequate to cover the cost of care.

A frequent concern on the part of the physician is that after initial participation in the HMO, the HMO will begin to rachet down payments since the physician has now become dependent on that income stream. This is unlikely to occur because again, capitation is based on actuarial data. It would not benefit the HMO to pay the physician less than reasonable costs to render care. To do so would ensure that the physician would become dissatisfied and unable to meet the health care needs of the enrolled population. Thus, care would not be satisfactory, the members would become unhappy, and possibly leave the HMO for other forms of health care delivery and ultimately, lead to the demise of the HMO. So, it is unlikely that payments under capitation will experience a progressive reduction. Another concern voiced regarding the capitation payment method is in reference to catastrophic illnesses. Major health care disasters, such as liver failure, neoplastic disease, renal disease, etc., with their attendant expensive technological support, could be devastating to the physician based on his captitation payment. The HMO recognizes this potential and has in place a cap on expenditures per member per year and at that point, payment for services exits the capitation mechanism and goes into a re-insurance fund. So, there is a limit to loss and as good advice in participating in an HMO, it is important to understand the mechanism for this stop-gap payment and the level at which it is applied.

There are basic keys to success in the medical practice of an HMO environment. Dr. Donald Schaller, recognized as one of the nation's leading experts on HMO health care delivery systems, refers to three reasons why HMO's fail:

(1) Poor communication between the parts.
(2) Bad management.
(3) Incurred but not reported claims.

In the fee-for-service environment, there is very little communication between the insurance company and the physician. Within the HMO it is essential that there be a constant dialogue between all the parts of the HMO, including the HMO itself, the physician providers and the hospitals currently utilized. Bad management speaks for itself. Clearly, there is a lot at stake and risks are high in any health insurance industry. Management of the available funds and resources by the HMO is critical to the long-term survival of the entity. Finally, incurred but not reported claims are health care costs generated by members in the HMO who are receiving services outside of the knowledge of the primary care physician. Payment through the capitation mechanism assumes that the primary care physician is either directly rendering those services or is aware of how those services are being provided. Outside the HMO environment, there will no longer be the sensitivity to cost effective health care delivery.

Another key to survival in the HMO is the impact of hospitalization on health care costs. As shown in the description of the premium dollar, the purchased services consume the majority of available funds. The biggest portion of those purchased services is for hospitalization. In this state, it is commonplace for hospitals to have per diem charges of $600 per day. These are expensive environments in which to render care. Obviously, they are necessary for certain medical problems. However, it is highly recommended that the primary care physician in the HMO develop a mechanism whereby he can monitor his patient activity in the hospital on a daily basis and thus avoid excess utilization. Do not entrust that important monitoring to a nonphysician. The HMO, through its utilization coordinator, is happy to provide that vital information to the primary care physician. There is one simple useful rule to determine appropriate utilization of hospital days. An ambitious utilization target for hospitalization would be 365 days per 1,000 members per year. Based on that, if the physician has 1,000 members enrolled in the HMO, he could anticipate each day having one patient within the hospital from his HMO population. If there is more than one, he is losing

money and losing it fast; and if less than one, he is clearly ahead. This monitoring of purchased services is time consuming and thus the primary care physician should benefit in any cost savings generated by good utilization control.

HMO's have clearly established a strong beachhead in South Carolina. As stated earlier, with the rapid growth over the past year and expected continued growth, it is realistic to anticipate that ultimately 25 percent of the population within the state will receive health care through an HMO system. Thus, those in private practice will have to participate in an HMO in order to enjoy financial success in practice. The HMO appears to be the primary care physician's gimmick. Here the definition of primary care is the family practitioner, general internist, or pediatrician. These individuals appear to be best suited to serve in the role as health care manager or "gatekeeper," if you prefer. Over the years, the primary care physician has, in fact, performed this role and frankly, has received poor remuneration from the fee-for-service structure. The HMO recognizes this valuable contribution by the primary care physician and rewards him for accepting the responsibility of managing the patient's total care.

There is reasonable concern as to how physicians feel about their role in an HMO structure. HMO's have been in existence for nearly 60 years and many physicians have practiced within that environment. They are pleased with the quality of care they deliver and of their professional experience. The question is often raised as to whether the medical care rendered is of a lesser quality than that in the fee-for-service environment. There are numerous studies[1-3] which demonstrate that the quality of care provided in the HMO is comparable to that in the fee-for-service environment.

The HMO does not seek to substantially alter the way physicians practice medicine. True, there are incentives to consider cost effective delivery of care, but the essential elements are left to the physician. Reading through any contract between an HMO and a participating physician clearly reveals that the HMO does not wish to direct the physician in the manner in which he renders health care. The way medicine is practiced has been and always will be the purview of the practicing physician. The difference in an HMO environment is not in the delivery of care, but simply the method of getting paid. □

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THE GREENVILLE HOSPITAL SYSTEM

JOHN K. WEBB, M.D.*

PRECURSORS

The idea for a City Hospital in Greenville, S. C. had its beginning in 1896. The event that began the City Hospital was triggered when an elderly man, a stranger to the city, became ill and subsequently died. A Lodge of the Knights of Pythias had been concerned with this man. Upon his death, the Lodge began to consider the need for a City Hospital. In fact, they went so far in their discussions that an organization was begun which was called the Greenville Hospital Association. Officers were elected and other support was sought in the community. In the course of time, the Hospital Association was placed on hold, but was brought up many times in the next few years.

There have been private hospitals in the past. There were two in Greenville during the War Between The States. A small sanitorium was operated for a short time in 1870. Mr. Charles Thomas, in his *History of Christ Church in Greenville*, relates that a sewing group was organized in 1870 to raise money for charity. In 1888, they operated a small hospital for the purpose of caring for sick persons of all races and creeds. In eight years, they cared for 79 persons gratuitously.

Another, more general group of ladies began a sewing circle in 1895 with the avowed purpose of using dues, and monies from crafts sold, to save for a future hospital. They made and sold things, and even at one point printed and sold a newspaper. As an example, in one of their bazaars in 1897, they marketed about 400 items.

VOLUNTARY HOSPITAL

Serious plans for a City Hospital got underway in 1906. A great many of the original planners were involved and the first chairman of the Hospital Association was again elected. It was at this time the men realized they needed the help of the ladies and thus there was begun a joint venture for the Greenville City Hospital.

Funds for the hospital were sought from many sources. There were $338 from The Knights of Phythias and the Rowena Chapter contributed $500. The ladies' sewing circle had accumulated $10,000. All clubs and churches were involved in the campaign for a hospital and by 1910, it was felt the Association could go ahead with a building. The funds on hand were added to shares purchased by members of the Hospital Association, and it was decided in 1911 to purchase the Corbett House on Arlington Avenue. This had been utilized as a treatment center for alcoholics in the past. During all of the planning stages for the hospital, physicians of the community gave active support. Mr. William Goldsmith and Dr. Davis Furman bought the building from Dr. L. G. Corbett for $20,000. The furnishings were part of the purchase price.

Great interest was given the hospital project when Drs. Earle and Black agreed to close their private hospitals and send patients to the new City Hospital. The press reported that the Hospital Association bought the equipment from the private hospitals. Dr. C. B. Earle told me that all of this equipment was donated.



FIGURE 1. The Corbett Wing, the first Greenville City Hospital opened January 10, 1912.

* 1916 Roe Ford Rd., Greenville, S. C. 29609.

Renovations and additions to the building were begun during 1911, and a Ms. Larney was employed as superintendent of the hospital. She, with the help of the physicians, set about the purchase of additional supplies for the hospital.

The Hospital Association Board asked the Medical Association of the county to join the staff and they made up a staff of 25 physicians. Among these physicians were three EENT physicians. There were two surgeons who had operated at the two private hospitals and, in addition, a pathologist was employed. Plans for opening the hospital on January 1, 1912, were delayed until the 10th of January, 1912. Following the opening, there were the usual problems of starting and operating a private hospital. Growth was steady and by 1918, it was realized that more space would have to be provided.

MUNICIPAL HOSPITAL

For some time prior to the opening of the City Hospital, the City Council had appropriated $100 a month to support a two-room charity clinic on Broad Street. This support was transferred to the new City Hospital and in 1918, the City Council agreed to purchase and operate the City Hospital. The center wing on Memminger Street was constructed, adding 125 beds. Following acquisition of the hospital by the city, the shareholders were reimbursed for their shares.

In 1929, there was need for additional space. It was at this time that Ms. Byrd B. Holmes, Superintendent of the Shriners Hospital for Crippled Children in Greenville, was employed to direct the hospital. During her administration, under trying financial conditions, further building was carried out. Four large multipatient wards were constructed, as well as a wing named for the renowned J. Marion Sims. The latter was opened in 1937 and was very modern for the time. There was air conditioning in the rooms if the patient cared to pay extra to have it. The cooling units were large cabinets and had to be installed by a plumber. Units were cumbersome and seemed to

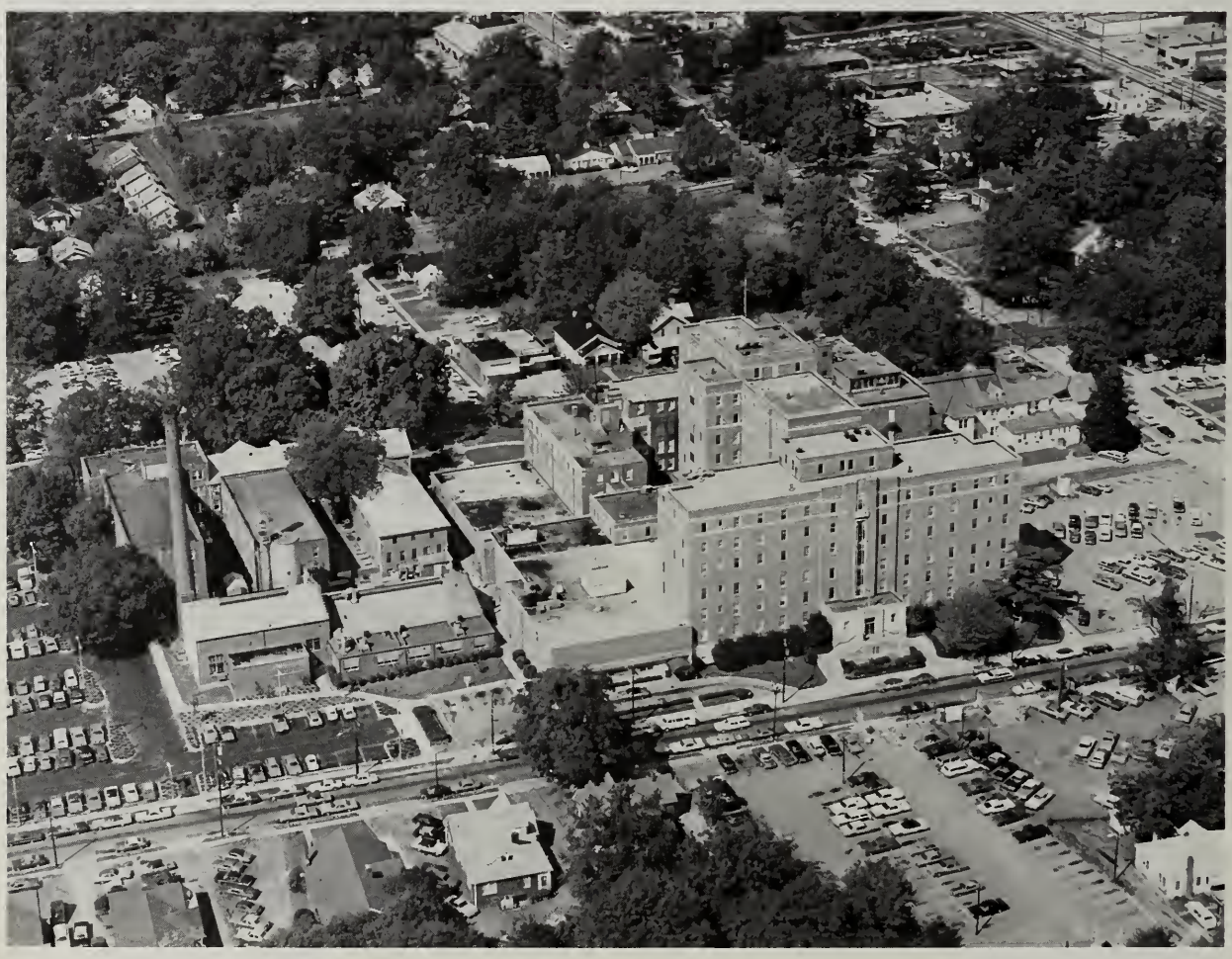


FIGURE 2. The Greenville General Hospital with all the additions to the Corbett wing, phased out in 1982.

be more trouble than they were worth.

COUNTY-WIDE HOSPITAL SYSTEM

In 1947, a referendum was approved which authorized the Hospital Board of Governors to provide hospital services for Greenville County. The Board was to be new, independent, and self perpetuating. This was passed by the General Assembly and is known as Act 432.

Following the passage of Act 432, the Board, with planning and advisory committees, began construction of two additional wings which served well through the '50s. A strong administration was developed by hiring Mr. Peter Terenzio from his position as Assistant Administrator at Roosevelt Hospital in New York. He brought in Mr. Bob Toomey as his assistant. Soon Mr. Terenzio was reclaimed by Roosevelt Hospital and the Hospital Board wisely hired Mr. Toomey as administrator with Mr. Jack Skarupa as his assistant. A more fortuitous appointment could not have been made by the Board. With the foresight of the Governing Board and the able administrators, Mr. Toomey and Mr. Skarupa, all of the succeeding steps have occurred.

Their idea to have Satellite Hospitals in three areas of the county has made the Hospital System so unique it has been studied by many people from elsewhere. Satellite Hospitals were constructed, as well as the Roger Huntington Nursing Center and Hospital at Greer, the unit at Simpsonville, and a unit in the Travelers Rest Area. Each of these hospitals has had an addition since its opening. Certainly, it is cost effective to have central purchasing as well as to have the large cost items housed at the central area. In the middle 60's it was felt that the General Hospital was inadequate and plans were made to acquire 128.7 acres of land on Grove Road and there to build a new facility. This was done, and what is now the Memorial Hospital was constructed, opening in 1972 with 676 acute medical and surgical beds.

The Marshall I. Pickens Psychiatric Hospital was put in service in 1969. At this writing a



FIGURE 3. The Memorial Hospital at the Grove Road site, Greenville, S. C. 1982.

Children's Psychiatric Hospital is nearing completion on the Grove Road site.

With the Satellite Hospitals and the facilities on Grove Road, The Greenville Hospital System has grown into a true Regional Medical Center for Upstate South Carolina.

On Grove Road in 1973, the Frank Earle Management Services Center was completed and the Roger C. Peace Rehabilitation Hospital was opened. The Sirrine Building for Family Practice was added in 1976, and a new Cancer Treatment Center in 1978.

The Memorial Hospital was enlarged to double its size in 1982, and this saw the transfer of all programs and services from the old General Hospital to the Grove Road site. A new Shriner Hospital for Crippled Children begun in 1985, will be connected to the Memorial Hospital.

At this time, practically any diagnostic test or treatment service is available in the Hospital System. A magnetic resonance imaging machine is being installed and a lithotripter awaits only approval of a Certificate of Need.

With regard to personnel, there are 4,300 employees with 105 interns and residents employed by the General Hospital System. The active staff of 600 physicians and dentists represents all of the medical specialties.

It is not possible in this short account to cover all the facets of the Greenville Hospital System. It is also not possible to include all of the thousands of men and women who have contributed to this magnificent hospital system.

The Soldiers Rest, operated by 300 ladies in the Academy of the Greenville Baptist Female College, was opened from July, 1862 until plundered and closed by Stoneman's Raiders in May, 1865. I like to think they really started the Greenville Hospital System. □

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SCMA NEWSLETTER

DECEMBER 1986

DECEMBER 31 DEADLINE FOR ELECTING MEDICARE STATUS

Physicians must make their 1987 Medicare participating or non-participating status decision by December 31. Carriers must be advised of your elected status no later than this date unless no change in status is desired. Use of registered mail is suggested.

A series of questions and answers, which was featured in the November 28 issue of American Medical News, was recently mailed to physicians in the December issue of the SCMA "Legislative Update". This is an excellent source to consult in making your decision. Copies are available upon request to the SCMA.

OFFICE CLINICAL LABORATORY SERVICES FOR MEDICARE

Effective January 1, 1987, Medicare will only pay for physician office laboratory testing on an assigned basis.

Failure to accept assignment for such services would make the patient responsible for the entire bill. The patient would receive no reimbursement from Medicare.

SC PRO UPDATE

Hospital administrators and chiefs of staff have received copies of the SC PRO's list of "Minor Surgical Procedures" and the PRO's procedure for review when such procedures are performed on an inpatient basis.

Additionally, the target date for SC PRO preadmission review is January 1, 1987; however, at the time of printing, no information has been mailed to physicians or hospitals. The PRO plans to require Medicare preadmission review for the following six procedures: permanent pacemakers, cholecystectomies, lens extractions, hip/knee replacements, TURP's and cardiac catheterizations.

For additional information, please contact:

Metrolina Peer Review Medical Foundation, Inc.
1 Charlottetown Center, Suite 150
Charlotte, North Carolina 28204
(704) 373-1545

MEDICAID WORKSHOPS

The South Carolina Health and Human Services Finance Commission will conduct Medicaid workshops during the month of January and February 1987. According to

Robert L. McRae, Head of the Department of Physician and Clinical Services at SCHHSFC, the workshops will include an overview of new Medicaid policy and procedures. A new Medicaid Provider Manual will be mailed prior to the seminars. Mr. McRae also stated that continuing medical education credits through USC will be awarded to interested medical managers. Physicians are also urged to attend. The SCMA will provide refreshments.

The scheduled workshops are as follows:

DATE	TIME	LOCATION
January 12	10:00 a.m.	Richland Memorial Hospital, Columbia, SC
January 13	1:30 p.m.	Beaufort-Jasper Technical Center, Beaufort, SC
January 14	1:30 p.m.	Trident Tech, Charleston, SC
January 20	1:30 p.m.	Conway Hospital, Conway, SC
January 21	1:30 p.m.	McLeod Regional Hospital, Florence, SC
January 27	1:30 p.m.	University Hospital, Medical College of Georgia, Augusta, GA
January 29	10:00 a.m.	Greenville General Hospital, Greenville, SC
January 29	1:30 p.m.	Spartanburg Regional Medical, Spartanburg, SC

Workshop locations for the month of February have not been confirmed, but will be held in the following cities: Rock Hill, Anderson, Sumter, Greenwood, Orangeburg, and Charlotte, North Carolina. For more information, please phone Mr. Bob McRae at 253-6137.

ADVISORY COMMITTEE ON ALZHEIMER'S DISEASE FORMED

A statewide Advisory Committee on Alzheimer's Disease Initiatives has been formed by the South Carolina Commission on Aging. The purpose of the committee is to act in an advisory or consultative capacity to the South Carolina Commission on Aging on all activities related to Alzheimer's Diease and related disorders.

Charles N. Still, M.D., of C. M. Tucker Center, is representing the SCMA as a committee member.

For more information about the advisory committee, please contact Ms. Kay Mitchell at the S.C. Commission on Aging.

PERSONAL MEDICATION RECORD

The South Carolina Commission on Aging has a personal medication record folder available to older South Carolinians. The folder is designed for use by the various physicians and pharmacists of elderly patients as a handy reference to prescribed medications, reasons prescribed and dosage. An accurate record can be easily utilized by the patient and/or caretaker for better medication maintenance. For samples, please contact the SCMA.

EYE CARE HELPINE

Older Americans who do not have an ophthalmologist and have not been examined by one during the past three years are eligible for free medical eye care.

The National Eye Care Project, which offers free care to U.S. citizens and legal residents age 65 and older, has received numerous inquiries from South Carolinians since the Helpline opened six months ago. Sixty-five ophthalmologists practicing in South Carolina are among the 7,000 eye physicians nationwide who have voluntarily joined the outreach project of the American Academy of Ophthalmology.

The program is a continuing effort by ophthalmologists to provide medical eye care for the disadvantaged elderly for as long as necessary.

Patients without Medicare or other insurance receive care at no charge. For those who do have coverage, participating ophthalmologists will accept insurance as payment in full without billing for co-payments or deductibles.

For more information, please contact the Helpline at 1-800-222-EYES.

JOIN THE SCMA AND SOCPAC NOW

SCMA and SOCPAC memberships continue to increase steadily over the years. Total membership of the SCMA for 1986 exceeds 2900. Membership in SOCPAC reaches an impressive total of 720.

With your efforts in urging your non-member colleagues to join the SCMA team not only can we increase our membership in the upcoming year, we can strengthen our efforts in advancing the goals of the SCMA.

SUPPORT GROUP NETWORK

Over 100 groups have joined to form the Support Group Network in the Midlands. The Network serves as a free information and referral center to individuals, organizations and agencies seeking others who share their concerns. Thus far, the groups have been classified into the following categories:

1) Addiction and dependencies
2) Bereavement and death
3) Health problems
4) Disabilities
5) Mental health
6) Parenting
7) Life situations and transitions

A computerized database of support groups and resources allows the network to act quickly and confidentially for interested parties. Information on national organizations is also available.

The Support Group Network can be reached at 791-9227, 8:30 a.m. to 5:00 p.m. Monday through Friday.

AMA'S MARKET AREA PROFILE SERVICE

Physicians entering practice, establishing in another area or interested in building a more efficient practice can subscribe to the AMA's valuable Market Area Profile Service. MAP Service provides vital demographic information about the residents in the area, their medical needs and their accessibility to

various medical services. Data obtained from MAP Service will enable physicians to determine what the potential practice base is in any specific area to plan accordingly for the future. MAPS reports include demographic, physician manpower and local hospital data. For additional information, call the AMA tollfree number 1-800-826-6895.

CLEFT HOTLINE

The American Cleft Palate Educational Foundation has instituted a 24-hour tollfree cleft hotline. Callers can now dial 1-800-24CLEFT for referral to local treatment teams and parental support organizations.

NEW ADDRESSES

The South Carolina Federation of Older Americans has relocated its office on the Opportunity School Campus to 101 Carolina Circle, West Columbia, South Carolina 29169.

Yes to Safety Belts has relocated its office to 1804-A Bull Street, Columbia, SC. The mailing address and telephone number remains P. O. Box 7773, Columbia, SC 29202, 252-7808.

CAPSULES...

Congratulations to the following physicians who recently were granted honorary membership status: Edwin B. Parkinson, M.D., Greenville; Lucius M. Cline, M.D., Greenville; and Risley F. Haines, M.D., Columbia.

Ralph P. Baker, M.D., of Newberry, has been appointed to an Advisory Council on Elder Affairs for the South Carolina Commission on Aging.

Columbian James W. Hammond, Jr., M.D., has been appointed as a replacement on the Medical Advisory Committee for the Health and Human Services Finance Commission.

George W. Brunson, M.D., of Columbia has been appointed to serve on an ad hoc committee to assist DHEC in drafting regulations for credentialing operators of sources of ionizing radiation.

William S. Hall, M.D. has received the Warren Williams Award from the American Psychiatric Association in recognition of his outstanding efforts in promoting the profession of psychiatry and the cause of mental health.

David Kulbersh, M.D. was named Outstanding Physician of the Year by the Rape Crisis Network for his sensitivity and professionalism in working with sexual assault victims and for his support of the network.

SCMA NEWSLETTER
is a publication of the
South Carolina Medical Association.
Contributions welcomed.
Melanie McLendon, Editor

THE COLUMBIA HOSPITAL OF RICHLAND COUNTY

HARDY WICKWAR*

THE VOLUNTARY HOSPITAL

In 1892, seven ladies and gentlemen of Columbia were chartered by the state as a non-profit corporation under the name, Columbia Hospital. They had been brought together by a charitable and religious association, the King's Daughters, for the purpose of providing care to sick persons who did not have the means to be cared for at home. The city of Columbia supported them by first leasing and then donating a four-acre block on the edge of the city that had formerly housed a small city almshouse.

In 1897, the board of lady managers organized a school of nursing on the Florence Nightingale model for two purposes. Primarily, it was to produce trained and responsible private duty nurses to care for sick persons in their own homes. Incidentally, its live-in students would provide free round-the-clock care for the hospital's patients, while the nursing instructor would serve also as superintendent of the little hospital.

The nursing school made the hospital attractive to Columbia's physicians and surgeons just when the capital city was getting its first specialists who drew referrals from its market area, Lister's antiseptics were making invasive surgery therapeutic, Roentgen's x-rays were adding to a surgeon's diagnostic tools, and childbirth was being surgicalized.

This changed the nature of the hospital. In becoming a doctors' workshop, it ceased to be only a charity. For its paying patients it needed the amenity of private rooms. For its surgeons it needed operating rooms and laboratory space, gas light and electric power. It had to hire a bookkeeper and cleaning and cooking personnel. It outgrew the voluntary donations of its benefactors, to the point where it had to raise capital by borrowing it for interest from Woodrow Wilson's maternal uncle, the Reverend Doctor James Woodrow, former president of the Presbyterian seminary (now the Robert Mills house and gardens) and of the University of South Carolina.

Some ladies of charity felt that a business enterprise was a regrettable departure from the charity to which they had devoted their efforts. Most felt that it was growing too big for them to manage. In 1909, therefore, they transferred its direction to its medical doctors.

The nurse managers and lady sponsors left behind them some records of the way they ran the hospital, which they later incorporated in a history that they lovingly wrote, whereas no records are known to survive from the medical management phase. This was perhaps typical of the way the doctors ran their workshop. By 1921, they were so deeply in debt to their suppliers that they joined with the local tradesmen in going to the county legislative delegation with a request that it rescue them.

The county taxpayers agreed to borrow $300,000 on the full faith and credit of the county, to pay the bills of the doctors' hospital and to catch up on building repairs. In return, the doctors gave their building to the county. So ended the voluntary hospital. So began the public hospital corporation.

THE COUNTY'S PUBLIC HOSPITAL CORPORATION

The hurriedly arranged marriage of convenience between Richland County and the Columbia Hospital was essentially a deal under which the county took over the hospital property but delegated its management to a Board of local business and professional people. The full implications of this arrangement had not been thought through, but soon emerged, as one practical problem after another loomed up.

Here was a special-purpose public authority or political subdivision with a Board selected by a legislative delegation which controlled the special legislation under which it operated, the county budget that paid the bills for such county patients

* Richland Memorial Hospital, Columbia, S. C. 29203.

as could not pay for themselves, and the real estate on and in which it functioned. It was perhaps inevitable that this corporate Board was immediately thrust into the maelstrom of politics.

What was less to be expected was that these were initially to be medical politics centering on the Columbia Medical Society and a Charleston-trained physician — hero of the great Charleston tidal wave — who was elected mayor of Columbia, Lawrence Owens.

The first medical problem which had to be solved was the relations between medical staff and Board. The Board insisted that it was there to represent all sections of the community and not only the doctors, that it was the Board and not the medical leadership that constituted the governing body, that the medical staff was a "rotary" and not an administrative group, and that the medical leadership was therefore only a medical advisory (and not executive) committee. This problem the Board itself settled by its own firmness.

Next came the question of which medical doctors should be eligible for the privilege of using the hospital. The specialists who had been running it wanted to continue to close it against non-specialists; it was to be a closed-staff referral hospital as in most European countries. The city's general practitioners working through the medical society fought to open it. They had a grand jury committee investigate the monopoly and had the county legislative delegation amend the hospital's charter so that all qualified members of the medical society who behaved themselves should be eligible for membership of this hospital's medical staff. Thus was this hospital brought into line, but not without a struggle, with what was becoming the standard community hospital practice in North America of allowing primary-care generalist doctors to attend their patients in hospital instead of having to refer them to specialists for inhospital care.

The third medical battleground arose over access to such new diagnostic tools as x-ray and laboratory. Should a group of private medical entrepreneurs enjoy the profits of local monopoly or should the users be free to benefit by market competition? The medical society, through the legislative delegation, obtained a further change in their public hospital's charter, obliging it to provide Columbia physicians with an alternative referral source.

The scope of the hospital's services and its role in the community healthcare system aroused much less contention. The years between the two World Wars were the heyday of "public health" and "preventive medicine" in South Carolina, and the Columbia Hospital found itself in the middle of this movement. It found room in its buildings or on its campus for the first local public health center with clinics for mothers and babies, tuberculosis, venereal disease and state cancer control, and local chapters of nationwide voluntary health associations. It also offered emergency care for patients transported by private vehicle or by funeral undertakers' hearse.

Its responsibility to serve all segments of the county citizenry was never in doubt. Insofar as some patients were less able than others to pay for care, the Board had to accept that about one in six of its inpatients, and one-half of them at the depth of the Great Depression, could not pay their bills. The Duke Endowment paid $1.00 a day — one-tenth of cost in the 1920's — towards their care. The rest had to be met each year as a charity item in the county budget which was then drawn by the legislative delegation and enacted by the State General Assembly, and the delegation agreed by law that any charity funds not expended by the hospital within the year could be used by its Board for improvements in plant or services. The Board contracted with the community Charity Organization Society to assure the delegation as to which patients were indeed needy.

This hospital from its beginning admitted black patients. When the black community established its own hospital in nearby Waverly, the Columbia Hospital paid it to care for the county's poor black patients. At the beginning of the World War II shortage of building materials, it obtained a federal New Deal grant to build its own black hospital on an adjoining city block which it had bought. Black doctors there had access to patients, although non-eligibility for the then all-white medical society gave them no claim to membership of the medical staff of the main hospital. The Columbia Hospital thus became the first in South Carolina to have more than 500 beds, but its two separate and unconnected buildings provided a physical barrier to effective integration when in 1965 it led the Columbia Hospital to what, for it, was a difficult and costly ethnic desegregation.

To help it serve the county's poor, one of the first acts of the public Board in 1922 was to hire a few interns — recent medical school graduates who were in process of getting their state licenses

and who welcomed the opportunity to get practical experience. They could take the place of the county physician in visiting the sick poor in their homes, besides helping attending physicians, as these took their turn in gratuitously caring for poor Richlanders who needed to be admitted to hospital or were ambulatory enough to come to an outpatient clinic. Twenty-five years after becoming a school of nursing, the hospital thus stumbled into becoming a rudimentary graduate school of clinical medicine with a volunteer faculty.

When minimum standards arose from within the practice of medicine, the Columbia Hospital achieved accreditation by the American College of Surgeons during the 1920's. When World War II experience was followed by a further wave of standard-setting, this hospital, in 1948, adopted model bylaws for its Board and medical staff, got accredited for post-graduate residency programs in medical specialties, and organized its medical staff in clinical departments that corresponded to nationally recognized specialities. Nor did these limitations on its freedom come only from within the national healthcare community. The structural safety of the hospital, for the first time in South Carolina, had to be brought up to licensing standards which the state adopted in order to qualify for federal health construction grants. For the Columbia Hospital, the obligatory addition of fire escapes and conversion of a fire-trap memorial building into offices was, in a sense, the price it had to pay for a Hill/Burton grant for an ambulatory clinic building.

Through many changes in the county's election of legislators and the legislative delegation's selection of trustees, the delegation tended to leave the running of the hospital to its Board while the Board depended on the delegation for annual budgetary support of charity patients, for legislative enactment of changes in its charter, and for authorizing occasional construction bond issues. However, when a new delegation tried to intervene in the detailed compensation of hospital employees in 1953, the Board of Trustees resigned and no new Board could be found until the delegation agreed to trust its Trustees. They summed up clearly the conditions under which alone they would serve: "Frankly, it is the unanimous feeling of your Board of Trustees that the Columbia Hospital should be run like an individual business concern. Your Board feels that, if the County can see fit to take care of its indigent people and the out-patient services of the hospital, then the hospital, on its own operating income, should more than likely be in a position to deduct, as a cash expense each month, the item of depreciation and deposit such funds in a separate bank account placed at the Lower Main Street Bank called the Columbia Hospital Depreciation Reserve Account. If we can accumulate such depreciation funds, the Board would not be placed in a position where they would continually have to request of the Richland County Delegation money to use for capital improvements and renovations. If such a fund accumulates to any sizable sum, it is entirely possible that part of such a fund could be used in helping amortize outstanding bonds against the institution or reduce rates charged private patients. Each of us feels that the hospital is too big a business not to be run on a strictly business principle. Any business should try to have in reserve enough operating funds for at least thirty to sixty days operation, because in case of a depression or grave emergency it might take at least thirty to sixty days to adjust the operation or the hospital to the necessary conditions" (24 March 1953).

This hospital's change of site and of name in 1972 symbolized a new phase in its response to a rapidly changing and challenging environment. □

ACKNOWLEDGMENT

This article has grown out of talks to the University of South Carolina Medical History Club and to Richland County Council, and owes much to L. Blackburn, et al., *History of Columbia Hospital 1892-47;* M. Padgette et al., *History of Columbia Hospital 1947-66;* the minute books of the Columbia Hospital Board of Trustees from 1921; and A. H. Walsh, *The Public's Business*, 1978. The author has served as recording secretary of the Board of Trustees of Richland Memorial Hospital, and gratefully acknowledges his debt to the Board and President, who are in no way responsible for any opinions here expressed.

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Season's Greetings

from

The South Carolina Medical Association

Continuing Medical Education

First Quarter 1987 Calendar

O'Neill Barrett, M.D., Chairman

Published by the S.C.M.A. Committee on Continuing Medical Education
Post Office Box 11188, Columbia, S.C. 29211

JANUARY

THURSDAY **JANUARY 15 (8:00 a.m.-5:00 p.m.)**
COLUMBIA, Elisabeth Poat Auditorium, Dorn VA Hospital
"The Management of the Difficult Diabetic Patient"

SPONSOR: USC School of Medicine and Dorn VA Hospital

DESCRIPTION: There will be separate sessions for physicians and allied health professionals. There will be 3 standard talks: (1) Difficult patient with Type I Diabetes; (2) Difficult patient with Type II Diabetes; (3) "Brittle" Diabetic patient. Each half day sessions will include a review of case reports.

AUDIENCE: Internist, Family Practice, Endocrinologists and Other Health Care Professionals.

CONTACT: J. Robert Hewson, M.D., (803) 776-4000 Ext. 222

FACULTY: Steven Leichter, M.D., Kentucky Diabetes Foundation

CME CREDIT: Applied For

MARCH

FRIDAY-SATURDAY **MARCH 6-7**
KIAWAH ISLAND, Kiawah Inn
"Laserama 1987"

SPONSOR: Department of Ophthalmology and Division of Continuing Education MUSC

DESCRIPTION: Wide variety of laser experiences by a variety of subspecialties. Attention to indications, technique and complications of each procedure.

AUDIENCE: Ophthalmologists

CONTACT: Odessa Ussery, (803) 792-8585

FEE: $300

FACULTY: Guest Faculty from across the country and faculty from MUSC Department of Ophthalmology

CME CREDIT: 9 Hours AMA Category I, .9 CEUs

FRIDAY-SATURDAY **MARCH 6-7**
CHARLESTON, The Charleston Place
"Seventh Annual Southern Symposium on Vascular Diseases"

SPONSOR: Vascular Laboratory and Department of Surgery, Roper Hospital Division of Continuing Education, Medical University of South Carolina

DESCRIPTION: A two-day state-of-the-art symposium designed to acquaint physicians, nurses and technologists with the advances in noninvasive diagnostic methods in peripheral arterial, cerebrovascular and venous diseases. Topics inlude Vessel Anatomy and Hemodynamics, Plethysmographic and Ultrasonic Principles, Duplex Ultrasound Scanning in DVT, abdominal and carotid arteries. Technologist members of the Society for Non-Invasive Vascular Technology will demonstrate many of the newest diagnostic methods available including plethysmography, duplex ultrasound, venous and transcranial Doppler methods.

AUDIENCE: Vascular surgeons, radiologists, neurologists, nurses, vascular and ultrasound technologists.

CONTACT: Jane B. Horne, R.V.T., Vascular Lab, Roper Hospital, (803) 724-2059

FACULTY: Local and guest faculty

FEE: $175.00 (includes continental breakfast, luncheon, breaks and reception)

CME CREDIT: 10 Hours AMA Category I for physicians, nurses and ARDMS certified technologists.

WEDNESDAY-FRIDAY **MARCH 18-20**
HILTON HEAD ISLAND, Regency Hyatt (Palmetto Dunes)
"Eighth Annual Symposium on Clinical Management of Diabetes and Endocrine Disorders"

SPONSOR: CSRA Diabetes Education Association; MCG; MUSC

DESCRIPTION: Lectures, questions and answers, workshops on Osteoporosis, Clinical Neuroendocrinology, Thyroid Disease and Diabetes Mellitus

AUDIENCE: Internal Medicine, Family Practice, Pediatrics and Endocrinology

CONTACT: Edwin D. Bransome, Jr., M.D., (404) 828-3445

FEE: $305; including amenities

FACULTY: Nationally recognized from 10 different medical schools

CME CREDIT: 13.75 Hours AMA Category I
13.75 Hours AAFP Prescribed

GRAND ROUNDS
U.S.C. School of Medicine

2nd and 4th WEDNESDAYS 3:00-4:00
GASTROINTESTINAL RADIOLOGY CONFERENCE
COLUMBIA, VA Radiology Dept. Conference IC 209, VA Hospital
SPONSOR: USC School of Medicine, Dept. of Radiology and Gastroenterology and Division of Internal Medicine
DESCRIPTION: One-half of the conference will be a discussion and film review of a specific subject. The second half will be devoted to current case material with both radiographic and endoscopic findings.
AUDIENCE: Radiologists, Gastroenterologist and other interested physicians
CONTACT: James J. Farrell, M.D., (803) 733-3295
FACULTY: USC School of Medicine, Dept. of Radiology; Division of Gastroenterology, Internal Medicine and Guest Speakers
CME CREDIT: 1 Hour AMA Category I per session

MONDAYS 7:00 A.M.
TUMOR BOARD
Richland Memorial Hospital - 1st Floor Conference Room
CONTACT: Frederick L. Greene, M.D.; or James McFarland, M.D. (803) 256-0308

MONDAYS 7:00 A.M.
ORTHOPAEDIC GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital - 1st Floor
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

MONDAYS 4:00 P.M.
BASIC SCIENCES SEMINAR SERIES
CONTACT: Alvin Fox, Ph.D., (803) 733-3288

MONDAYS-THURSDAYS 12:00-1:00 P.M.
INTERNAL MEDICINE LECTURE SERIES
Richland Memorial Hospital 7 West Classroom
CONTACT: J. O'Neal Humphries, M.D., (803) 765-6563

1st & 3rd MONDAYS 12:30 P.M.
G.I. JOURNAL CLUB
Dorn Veteans' Hospital Room 5A127
CONTACT: John Orchard, M.D., (803) 776-4000 Ext. 673

MONDAYS, TUESDAYS, WEDNESDAYS, & THURSDAYS 12:00-1:00 P.M.
FAMILY PRACTICE CONFERENCE
COLUMBIA, Richland Memorial Hospital, Large Dining Room of the Cafeteria—Mondays—Family Practice Conference Room—Tuesdays and Thursdays
SPONSOR: Dept. of Family Practice, USC School of Medicine
AUDIENCE: Family Practice and Internal Medicine Physicians and Medical Students
CONTACT: Roslyn D. Taylor, M.D., (803) 765-6118, Dept. of Family Medicine Richland Memorial Hospital, Columbia, SC
FACULTY: Dept. of Family Medicine and Internal Medicine, USC School of Medicine
CME CREDIT: 1 Prescribed Hour American Academy of Family Physicians per session

TUESDAYS 7:00 A.M.
BASIC SCIENCE & PATHOLOGY ASPECTS OF ORTHOPAEDICS
Richland Memorial Hospital - Radiation Therapy Conference Room
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

3rd TUESDAYS 12:30 P.M.
OB/GYN GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital
SPONSOR: USC Dept. of OB/GYN, RMH, MUSC, Spartanburg and Greenville
DESCRIPTION: One of a series of live interactive broadcasts over the HCN, a statewide closed circuit TV network for CME in OB/GYN.
CONTACT: Ronald B. Wade, M.D., (803) 765-7156
FEE: None
CME CREDIT: 1 Hour AMA Category I (per session)

2nd & 4th WEDNESDAYS 7:00 A.M.
TRAUMA CONFERENCE/SURGERY
Richland Memorial Hospital Auditorium
CONTACT: Richard Bell, M.D., (803) 256-0308

1st & 3rd WEDNESDAYS 7:00 A.M.
VASCULAR SURGERY CONFERENCE
Richland Memorial Hospital Auditorium
CONTACT: T.J. Bunt, M.D., (803) 256-0308

WEDNESDAY 12:00 NOON
PSYCHIATRY GRAND ROUNDS
Hall Institute Form
CONTACT: Bonnie Ramsey, M.D., (803) 758-8052
CME CREDIT: 1 Hour AMA Category I (per session)

4th WEDNESDAY 12:00 NOON
PATHOLOGY: MORTALITY TEACHING CONFERENCE
Room 3A110, Building 100, Dorn Veterans' Hospital
CONTACT: Nicholas J. Pappas, Jr., M.D., (803) 776-4000, Ext. 394 or 3
CME CREDIT: 1 Hour AMA Category I

2nd & 4th WEDNESDAYS 12:00 NOON
PULMONARY MEDICINE CHEST CONFERENCE
Richland Memorial Hospital, 7th Floor Conference Room
1st & 3rd THURSDAYS 12:00 NOON
3rd Floor Conference Room, Dorn Veterans' Hospital
CONTACT: Gerald N. Olsen, M.D., (803) 733-3112

2nd & 4th WEDNESDAYS 4:00 P.M.
SURGICAL G.I. CONFERENCE
Dorn VA Hospital, Room 3A-110
CONTACT: Frederick L. Greene, M.D. (803) 256-0308

WEDNESDAYS 6:00 P.M.
ORTHOPAEDICS PROBLEM CONFERENCE
Richland Memorial Hospital Conference Room "P", ACC II
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

THURSDAYS 10:00 A.M.
HEMATOLOGY/ONCOLOGY GRAND ROUNDS
Dorn Veterans' Hospital, 5-West Classroom
CONTACT: George P. Sartiano, M.D., (803) 733-3112

4th THURSDAY 12:00 NOON
G.I. RESIDENTS CONFERENCE
Dorn Veterans' Hospital, 4th Floor Conference Room
CONTACT: John Orchard, M.D., (803) 776-4000, Ext. 673

4th THURSDAY 3:30 P.M.
NEUROSCIENCE JOURNAL CLUB
SPONSORS: USC School of Medicine & Dorn VA Hospital
CONTACT: Charles Gibbs, Ph.D., (803) 776-4000, Ext. 128
PLACE: USC School of Medicine or Dorn VA Hospital

1st THURSDAYS 4:00 P.M.
RADIOLOGY DEPT. CONTINUING EDUCATION CONFERENCE
USC School of Medicine Library Bldg., Room B-116
CONTACT: David F. Adcock, M.D., (803) 733-3295
CME CREDIT: 1 Hour AMA Category I

THURSDAYS 1:00 P.M.
ENDOCRINE CASE PRESENTATION
USC School of Medicine Administration Bldg. 2nd Floor Conference Room
CONTACT: Juraj Osterman, M.D., (803) 733-3112

FRIDAYS 7:00 A.M.
ORTHOPAEDIC SUB-SPECIALTY TOPICS
Richland Memorial Hospital - Large Private Dining Room
CONTACT: Edward E. Kimbrough, III, M.D., (803) 765-6812 or 6383

FRIDAYS 8:00 A.M.
PEDIATRIC GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital
SPONSOR: USC School of Medicine, Dept. of Medicine
CONTACT: Warren Derrick, M.D., (803) 765-7211
CME CREDIT: 1 Hour AMA Category I (per session)

FRIDAYS 9:30-11:30 A.M.
PREVENTIVE MEDICINE GRAND ROUNDS
USC School of Medicine Library Bldg. Room 327
CONTACT: Alan Chovil, M.D., (803) 733-3306
CME CREDIT: 2 Hours AMA Category I

3rd FRIDAY 12:00 NOON-1:30 P.M.
NEUROPSYCHIATRY AND BEHAVIORAL SCIENCE
Dix Conference Room, William S. Hall Psychiatric Institute
CONTACT: Robert J. Pary, M.D., (803) 758-3068

FRIDAYS **1:00 P.M.**
INTERNAL MEDICINE GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital Auditorium
SPONSOR: Dept. of Medicine, USC School of Medicine
AUDIENCE: Internal Medicine and Family Practice Physicians
CONTACT: J. O'Neal Humphries, M.D., Chairman, Dept. of Medicine, (803) 765-6563
CME CREDIT: 1 Hour AMA Category I

SATURDAYS **9:00-10:00 A.M.**
SURGICAL GRAND ROUNDS
COLUMBIA, Richland Memorial Hospital Auditorium
SPONSOR: USC School of Medicine, Dept. of Surgery
DESCRIPTION: Lectures and case presentations given by the department staff and guest speakers
AUDIENCE: Faculty, Residents, Students and Private Clinicians
CONTACT: Carl H. Almond, M.D., (803) 254-4158; James L. Haynes, M.D., (803) 765-7452; Frederick L. Greene, M.D., (803) 776-4000, Ext. 582
FACULTY: Staff of Dept. of Surgery and guest lecturers
CME CREDIT: 1 Hour AMA Category I (per session)

GRAND ROUNDS
Medical University of South Carolina

MONDAYS **8:30-9:30 A.M.**
PATHOLOGY (ext. 3121) Surgical Pathology Conference
Quadrangle - Room E215

MONDAYS **12:30-1:30 P.M.**
RADIOLOGY (ext. 5071) Noon Conference
Hospital — Room B317

MONDAYS **4:00-5:00 P.M.**
RADIOLOGY (ext. 5071) Special Imagining Conference
Hospital — Room B312

MONDAYS
RADIOLOGY (ext. 5071) Visiting Radiologist
Hospital — Room 315B

EVERY OTHER MONDAY **10:00 A.M.-12:00 NOON**
PATHOLOGY (ext. 3121) Pathology Microscopic Roundtable Conference
Quadrangle Building — Room E215

4th MONDAY **2:30-3:30 P.M.**
LABORATORY MEDICINE (ext. 2858) Phlebotomist: Inservice Update Program
Hospital — 2 West Classroom

TUESDAYS **7:00-8:00 A.M.**
SURGERY (ext. 3961) Surgical Grand Rounds - Cancer Conference
2-W Amphitheater —MUH

TUESDAYS **9:00-10:00 A.M.**
MEDICINE GRAND
CONTACT: Jane C. Allen, M.D., (803) 792-2911

TUESDAYS **7:00-8:00 A.M.**
ORTHOPAEDIC SURGERY (ext. 3934) Grand Rounds — Weekly
MUSC — Room 428

TUESDAYS **11:00 A.M.-12:00 NOON**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4050)
Departmental Grand Rounds — MUH Amphitheater

TUESDAYS **12:30-1:30 P.M.**
OBSTETRICS/GYNECOLOGY(ext. 4509)
TV Grand Rounds in Obstetrics and Gyncology
MUH — Amphitheater

2nd & 4th TUESDAY **1:30-3:00 P.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE 577-5011 (ext. 234)
Case Conference
Veterans' Administration Hospital

TUESDAYS (as scheduled) **9:00-11:00 A.M.**
PATHOLOGY (ext. 2456/3121)
Seminar-Tutorial Groups Sessions, Systemic Pathology
Basic Science Building or Quadrangle (where scheduled)

TUESDAYS **8:30-9:30 a.m.**
OBSTETRICS/GYNECOLOGY (ext. 4509) Morning Conferences
Clinical Science Building — Room 624

TUESDAYS **2:00-3:30 P.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4050)
Adult Outpatient Case Conference
University Service Building — Chairman's Conference Room

2nd & 4th TUESDAY **4:00-5:00 P.M.**
PATHOLOGY (ext. 3121) Renal Conference
Basic Science Building — Room 648

1st & 3rd TUESDAY **4:00-5:00 P.M.**
PATHOLOGY (ext. 3121)
Gastrointestinal Pathology Conference (GI Conf)
Basic Science Building — Room 648

WEDNESDAYS (except last) **9:00-10:00 A.M.**
PATHOLOGY (ext. 2131) Graduate Medical Education in Pathology
Basic Science Building — Room 648

LAST WEDNESDAY **9:00-11:00 A.M.**
PATHOLOGY (ext. 3121) Grand Rounds — Pathology
Basic Science Building — Room 648

WEDNESDAYS **10:00-11:00 A.M.**
LABORATORY MEDICINE (ext. 2671) Blood Bank Conference
Quadrangle/Pharmacy — Room 209/310

WEDNESDAYS **12:00 NOON-1:00 P.M.**
PSYCHIATRY & BEHAVORIAL SCIENCE (ext. 4037)
Psychiatry Journal Club
University Service Building — Chairman's Conference Room

WEDNESDAYS **1:00-2:00 P.M.**
LABORATORY SERVICES (577-5011 ext. 466)
Charleston Veterans' Administration Clinical Pathology Conference
Veterans' Administration Hospital — Room B-243

4th WEDNESDAY **2:30-3:30 P.M.**
CYTOTECHNOLOGY/HISTOTECHNOLOGY (ext. 2041)
Histotechnology Journal Club
Quadrangle — Room QE 215

WEDNESDAYS **3:00-4:00 P.M.**
PATHOLOGY (577-5011 ext. 466)
Charleston Veterans' Administration Medical Center Tumor Board
Veterans' Administration Hospital

WEDNESDAYS **3:00-4:00 P.M.**
LABORATORY MEDICINE (ext. 2933) Hematology Conference
Quadrangle — Room B-106

WEDNESDAYS **6:30 P.M.-?**
OBSTETRICS/GYNECOLOGY (ext. 4509)
Monthly Journal Club Meeting — Outside Location

WEDNESDAYS **6:00-7:00 P.M.**
RADIOLOGY (ext. 5071) Low Country Ultrasound Society
Hospital — Room B-317

THURSDAYS **8:30-9:30 A.M.**
OBSTETRICS/GYNECOLOGY (ext. 4509) Morning Conference
Clinical Science Building — Room 624

THURSDAYS **8:00-9:00 A.M.**
RADIOLOGY (ext. 5071) Teaching Conference in Neuroradiology
Hospital — Room B-317

THURSDAYS **8:30-10:00 A.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4037)
Psychiatry Youth Conference — Clinical Science Building - Room 623C

THURSDAYS **8:30-10:00 A.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE (ext. 4037)
Teaching Case Conference for Consultation/Liaison Service
Clinical Science Building — Room 623C

THURSDAYS **8:30-10:00 A.M.**
PSYCHIATRY (ext. 3051) Child Psychiatry Seminar
Clinical Science Building — Room 623C

THURSDAYS **9:30-10:30 A.M.**
NEUROSURGERY (ext. 2421) Neurosurgery Clinical Conference
Clinical Science Building — Room 428

THURSDAYS **10:30-11:30 A.M.**
NEUROLOGY (ext. 3221) Neurology Grand Rounds
Clinical Science Building — Room 300

THURSDAYS **10:30-11:45 A.M.**
NEUROSURGERY (ext. 2421) Neurosurgery Lecture
Clinical Science Building — Room 300

THURSDAYS (as scheduled) **9:00-11:00 A.M.**
PATHOLOGY (ext. 2456/3121)
Seminar-Tutorial Group Sessions, Systemic Pathology
Basic Science Building or Quadrangle (where scheduled)

THURSDAYS **12:00 NOON-1:00 P.M.**
PATHOLOGY (ext. 3581/3121) Neuropathology Conference
Basic Science Building — Room 737

THURSDAYS **1:00-2:00 P.M.**
PATHOLOGY & DERMATOPATHOLOGY (ext. 3821/3121)
Dermatopathology Conference — Quadrangle-Room E215

THURSDAY (once/month) **2:30-3:30 P.M.**
LABORATORY MEDICINE (ext. 2671)
Immunohematology Journal Club — Quadrangle Room 104

THURSDAYS **4:15-5:30 P.M.**
NEUROSURGERY (ext. 2421) Neurosurgery Didactic Lectures
Clinical Science Building — Room 428

1st THURSDAY **5:30-7:30 P.M.**
NEUROSURGERY (ext. 2421) Journal Club

FRIDAYS **8:30-10:00 A.M.**
MEDICINE/ENDOCRINOLOGY (ext. 2528)
Endocrinology Journal Club, Endocrinology Research Conference
Clinical Science Building — Room 910

FRIDAYS **10:00-11:30 A.M.**
PSYCHIATRY & BEHAVIORAL SCIENCE
Teaching Case Conference, Adult Inpatient
MUH — Room 7W Conference Room

FRIDAYS **12:00 NOON-1:00 P.M.**
PATHOLOGY (ext. 3556/3121) Clinico-Pathologic Conference (CPC
Mu Hospital — Room 2W Ampitheater

FRIDAYS **2:30-4:00 P.M.**
MEDICINE (ext. 2000) Division Rounds (Case Conference)
of the Division of Rheumatology & Immunology
Clinical Science Building — Room 912

FRIDAYS **4:00-5:30 P.M.**
MEDICINE/ENDOCRINOLOGY (ext. 2528)
Endocrinology Case Conference
Clinical Science Building — Room 906E

FRIDAYS **8:30-9:30 A.M.**
PATHOLOGY (ext. 3121) Surgical Pathology Conference
Quadrangle — Room E215

FRIDAYS **12:30-1:30 P.M.**
RADIOLOGY (ext. 5071) Noon Conference
Hospital — Room B317

FRIDAYS **4:00-5:00 P.M.**
RADIOLOGY (ext. 5071) Special Imagining Conference
Hospital — Room B312

FRIDAYS
RADIOLOGY (ext. 5071) Visiting Radiologist
Hospital — Room 315B

FRIDAYS **8:30-9:30 A.M.**
OBSTETRICS/GYNECOLOGY (ext. 4509) Morning Conferences
Clinical Science Building — Room 624

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AIR FORCE



St. Luke may well have been influenced by some of the apocryphal writings in the books of wisdom such as these from Sirach: "The Lord created medicines from the earth and a sensible man will not despise them." "And give the physician his place for the Lord created him; let him not leave you, for there is need of him. There is a time when success lies in the hands of physicians, for they too will pray to the Lord that he should grant them success in diagnosis and in healing for the sake of preserving life."

The influences we have been discussing range from possibilities to probabilities. But there is a certainty about the influences upon St. Luke, and that is the impact made upon him by his extensive research into the life of Jesus. We know that he was well versed in St. Mark's account of Jesus and used some of it as a basis for his own gospel. It is likely that he also was familiar with St. Matthew's account. He traveled widely with St. Paul and lived with him some of the time. We can well imagine those conversations in the evenings before the fires as Paul described his visions and dreams and most dramatically his encounter on the road to Damascus. There is strong evidence that some of St. Luke's information came from Berea, where many of the events occurred, and even stronger evidence that he visited and talked with Mary, the mother of Jesus. What could he have learned from all of this that helped shape his practice of medicine?

Well, from the way Jesus chose his disciples, St. Luke could have learned acceptance of people at whatever point he found them. Jesus didn't wait for Peter to become president of a chain of fish markets; he accepted him just as he encountered him, squatting on the beach, salty, smelly, unkempt, mending his nets. He didn't wait for Matthew to become secretary of the treasury; he accepted him as a despised tax collector. And so St. Luke could have learned to accept patients that were uninteresting, unlovable, chronically complaining, always demanding — just as they were.

He could have learned from the way Jesus spent time with his disciples something about relating to patients. Some of the time Jesus talked to his disciples, often having to explain things in their understandable terms. Equally often, he listened to them. He shared his own deep feelings with them as he ministered to theirs. Much of the time he simply was with them, giving them the gift of his total presence. Paul Tournier, writing in our highly scientific 20th century, says that the *relationship* between the physician and the patient often is more important than the medication prescribed or the treatment instituted.

From the account of Jesus and the woman taken in adultery, St. Luke could have learned to be nonjudgmental and to forgive. From the story of Jesus' reaction to Lazarus' death, he could have learned compassion and that it was acceptable for others to see a physician's grief. From the numerous accounts of Jesus' healing when he said "Thy faith has made thee whole," he could have been convinced of the spiritual aspect of healing. What St. Luke learned about Jesus could add to the art and science of medicine, the extra dimension of ministry.

Most of us gathered here today will not always have charming, delightful, exciting, interesting patients. Much of our time is spent with the less affluent, the less privileged, the uncharming, the less interesting. Today as we remember St. Luke, the beloved physician, let us also remember ministry in our care of patients, in whatever we do to whomever needs it, in whatever state of life they are in at the time, for Jesus said, "Inasmuch as you have done it to one of the least of these my brethren, you have done it also unto me." □

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Editorials

CROSSROADS

Selecting manuscripts for each month's issue of *The Journal*, we generally prefer a balance between "original scientific articles" and "special articles" dealing with social, economic, historical, and ethical aspects of medicine. For this December's issue, we chose four manuscripts from the latter category, believing that our members might find in them a basis for holiday season reflections.

Dr. John A. Gastright's paper provides a useful primer on health maintenance organizations. Around South Carolina, physicians already feel the impact of "payment . . . based on the number of members enrolled, not on services rendered . . .". For the first time in recent memory, physicians have incentives to save money rather than to provide the best possible medical care. We can anticipate enormous conflicts not only with third parties but also with patients, with each other, and with our own consciences. The hospital-based practice of medicine will be especially affected and indeed may never be the same.

The next two articles chronicle the development of two major hospital systems in our state. One sobering point emerges from these articles: the hospital system taken for granted by our generation is a relatively recent innovation. Hardy Wickwar, who has mastered the evolution of hospitals from a conceptual viewpoint, reviews this topic in the editorial which follows. The late 19th century movement toward voluntary hospitals blossomed in the early 20th century into the concept of hospitals as "doctors' workshops" for performance of an ever-growing number of elaborate procedures. Then, the advent of third party reimbursement reinforced to physicians their inalienable right to admit patients to hospitals for the most sophisticated and expensive care available. The new financing principles challenge this right, and the implications are painful.

Many persons who heard Dr. Richard Sosnowski's non-denominational service at this year's annual SCMA meeting urged its publication in our journal. Having contemplated both our near future and our recent past, it seemed appropriate to conclude our issue with this different kind of message. Contemplating the life of St. Luke, Dr. Sosnowski exhorts us to take interest in our patients irrespective of the circumstances. This is, of course, the hallmark of all truly great physicians, and in a more secular context one is at once reminded of Francis Peabody's famous statement that "the secret of the care of the patient is caring for the patient." But this fundamental message seems especially poignant as we stand at what future historians are likely to call an important crossroads for medicine in America. We must work together — *as members of a profession interested above and beyond our own personal concerns* — to prove once again to society our uncompromising commitment to its best interests.

— CSB

TWO UPSTATE METROPOLITAN PUBLIC HOSPITAL CORPORATIONS

Guest editorials reflect the opinions of the authors and do not necessarily reflect the opinion of the South Carolina Medical Association or the Editorial Board.

Between the profit-oriented private sector and the tax-financed public sector there is a "third sector" that provides health and other services and consists partly of public corporations which pay their way and partly of private corporations which are non-profit. Of the patients currently in South Carolina's short-stay community general hospitals, 87 percent owed their care in 1984 to this third sector: one-half to public hospital corporations and one-half to private non-profit corporations, with the small remainder being served mainly by new out-of-state for-profit chains.

This high ratio of patients served by public hospital corporations has been typical of this state and region ever since the years around World War I when professional nursing was making hospitals into good places for medical doctors to treat paying patients, provided capital could be borrowed for newly-devised antiseptic operating and delivery rooms and newly invented x-ray. Hospitals no longer had to be thought of only as charity institutions for persons who did not have homes where they could be cared for; but the least expensive way of raising capital was then through local government borrowing.

These South Carolina public hospital corporations developed essentially as autonomous organs of local government created one by one by a state legislature in which every legislative delegation was then the policy maker for its county. On the one hand, like private non-profit corporations, they were free to charge for services, free from external budget approval, free from dependence on external operating appropriations, and run by boards that could sue and be sued. On the other hand their public status brought potential assets and liabilities that distinguished them from private non-profit hospital corporations. It improved their chances of getting capital, by dedication of public property to hospital use and by possible commitment of the full faith and credit of the county to meeting the cost of a public hospital's tax-exempt bonds. Yet, at the same time, investment in a short-stay general hospital became one of a county's means of "provision for all those inhabitants who by reason of . . . infirmities and misfortune may have a claim upon the sympathy and aid of society" (Constitution 1895), supplemented sometimes by county reimbursement of services rendered to its most vulnerable inhabitants.

South Carolina's public hospital corporations were therefore essentially local special-purpose public authorities — in the style of the New York Port Authority established in 1921 — although they differed from some other political subdivisions such as school districts in that their boards were not directly elected by taxpayers and did not levy or precept taxes.

South Carolina's two upstate metropolitan medical centers took the lead in this state in setting the style for this new public corporate way of funding and running hospitals.

First came Greenville, where the business community, the feminine leadership, the city council and the county legislative delegation all worked together to transform a new voluntary hospital into the City Hospital of the City of Greenville in 1917, with the city taxpayers providing the plant, a self-perpetuating Board of Governors running it, a medical staff executive committee providing professional advice and a nursing superintendent providing day-by-day management.

Columbia followed shortly after with a somewhat similar but less well-planned arrangement after thirty years of private non-profit trial and error, culminating in a credit crisis in which all the parties agreed in 1921 for the county legislative delegation to take over the plant and appoint a Board of Trustees to run it in a businesslike manner.

When federal Hill/Burton legislation made one-time grants available through the states for investment in non-profit hospital facilities to serve both paying and medically indigent citizens, Greenville County qualified for this new source of capital the very week the state adopted the law in 1947. Being unwilling to transfer its hospital to Greenville County, the City of Greenville agreed to transfer it to "an independent board, free from

the control of the corporate authority of the city or the county and charged with the duty of operating said hospital and its expanded facilities." The Greenville General Hospital Board of Trustees was therefore to be self-perpetuating, subject to approval by city and county and to commissioning by the governor, and was to have the right to freely own and dispose of additional hospital property as well as the privilege of eminent domain just like the Highway Department or a railroad. Here was a model for others to follow, and that has held good for now forty years. The Columbia Hospital of Richland County underwent no similar restructuring: its county legislative delegation simply consolidated its many piecemeal statutes.

Both Greenville and Columbia have amply justified their double public but corporate status by providing extensive public services as well as rendering personal care. Both have helped provide the state and nation with their next generation of health professionals, and since 1972 they have done this by affiliating their residencies with the state's medical schools. Both have facilitated access to persons needing care, regardless of how far they could pay, had sponsors or had their own doctors. Both have been recognized by the state as providing their service areas with specialized tertiary-level perinatal, trauma and other services. Both became full-service hospitals that offered physicians and patients protection against private monopolies. Both have earned public payment for at least some of the public services they have rendered.

Hardy Wickwar
Professor Emeritus of
Political Science,
University of South Carolina; and
Consultant in Planning,
Richland Memorial Hospital

LETTERS TO THE EDITOR

To the Editor:

In further communications with members of DHEC who had provided data included in our paper "A Five Year Study of Intestinal Parasites in Charleston, South Carolina," we have discovered that some corrections are required to Table 2. We would be grateful if you would consider publishing an erratum as follows:

In Table 2 on page 329, *Trichomonas hominis* should read: *Trichomonas vaginalis* and *Fasciola sp* should read *Fasciolopsis*. The figures for percent positive were based on the total number of parasites found rather than on the number of positive samples. For each of the columns, in order, the number of positive samples and the percentage positive samples of the totals are 1100/13.4%, 984/14.2%, 1061/16.3%, 871/14.2% and 4016/14.4%.

We hope that you will be able to include this erratum in a forthcoming edition of your Journal and are sorry to have caused you this inconvenience.

Carolyn Dover, B.S.M.T.
Judy Jarecki-Black
Predoctoral Candidate
Parasite Immunology
Molecular and Cellular Biology
and Pathobiology
Medical University of S. C.
Charleston, S. C. 29425

To the Editor:

Much to my delight when I picked up the South Carolina Medical *Journal* to find the picture of Eli Geddings on the cover, and your most interesting article. Eli Geddings was my great grandfather whom I am grateful for his contribution to medicine. Eli had a marvelous brain, and to think his idea of cancer coincides with modern-day thinking. His son, Frederick, my grandfather, had four sons, all physicians, and my father, the late Louis P. Dotterer a dentist, so what chance did I have. My granddaughter is a Registered Nurse.

Thanks again for your nice article which I am keeping for my grandchildren.

Tom Dotterer, M.D.
294 Springmoor Drive
Raleigh, N. C. 27615

FINANCIAL CHECKUP

MARTIN LEFKOWITZ
Certified Financial Planner
Tax Shelter Co-Ordinator: E.F. Hutton

Vol. 6, Issue No. 12 December 1986

LETTER TO THE READERS OF THE "FINANCIAL CHECKUP."

Dear Readers:

This will be the last issue of the "Financial Checkup." I thoroughly enjoyed writing the series for the past six years. I hope the information presented was of value to you, the Reader.

E.F. Hutton is now presenting in a timely fashion reports emphasing topics that focus on the areas of interest I presented in the newsletter. If you are interested in receiving this information, please call me (toll free) at (800) 922-1112, or fill out and mail the form shown below.

I want you to know that I will still be available, at no obligation to you, to answer any questions you may have regarding your investments.

Thank you; and with best regards, I am

Sincerely,

Martin Lefkowitz, CFP
Assistant Vice President

(Please place in envelope. Thank you.)

TO: Martin Lefkowitz
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COMMENTS: _____

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ON THE COVER: JOEL ROBERTS POINSETT

It wouldn't be Christmas without them, or perhaps, it wouldn't be an inaugural ball without them. The flaming scarlet leaves of the poinsettia plant are recognized throughout the world as being the Christmas flower, but this "flor de Noche Buena" meaning the Flower of the Holy Night was unknown in the North American continent prior to the mid-1800's.

Joel Roberts Poinsett, a South Carolinian and a Charlestonian, was born March 2, 1779. At the end of the Revolutionary War he was taken by his father to England where he received his classical education. He returned to America and studied under Dr. Dwight at Greenhill in Connecticut, and later attended schools in London and at Edinburgh. He received his medical lectures at Edinburgh and initially intended to be a physician. Because of medical problems, he spent time in Lisbon, Portugal, to regain his health. He was convinced that his health would not permit "the espousal of a sedentary calling" so he took up the study of military science. In 1800, he felt his health had been restored and he returned to Charleston. At this time he took up legal tutorage under Mr. M. DeSaussure who later became chancellor of South Carolina. In 1801, he terminated his study of law and left for Switzerland. He pursued travel throughout Europe for a number of years but on learning of his father's death, he returned. Shortly after his father's death, he went back to Europe and remained there only to return to America after an attack on an American ship, the Chesapeake. On his return to the United States, he was sent by President Madison to South America and his travels on that continent eventually took him to Chile where he gained recognition in the military sphere. An attack and capture of ten American whaling ships raised his indignation and when offered the command of a small force of Chilian soldiers, he led them to take Talca and liberated the American vessels.

Dr. Poinsett returned to Charleston and became involved in many enterprises. However, in 1821, he was elected to Congress from Charleston and was appointed by President Adams as Minister Plenipotentiary to Mexico. It was during this time that Dr. Poinsett was able to garner his ardent interest in botany and collect an extensive array of exotic plants. He brought these plants back to the South Carolina low country for his gardens at Casa Blanca Plantation near Charleston. During a visit by James Knox Polk, destined to become President of the United States, Mrs. Polk noticed a magnificent "fire plant" with brilliant whirls of scarlet leaves, and expressed to Dr. Poinsett her admiration of this flower. Following her return from her visit at Casa Blanca, Sarah Polk, who had been pondering what she should wear at her husband's inaugural ball, notified her seamstress that she wanted a gown decorated with the floral pattern of the poinsettia leaf. This was accomplished and the recognition and reputation of this magnificent flower was established. It is reported that following the introduction of the poinsettia into New York and Washington society, the nurseries who nurtured the flower in the south were unable to meet the mounting demand for the supply of these plants. It is because the flower blooms in December that it became a recognized part of traditional Christmas decorations.

A biographer of Poinsett noted that Joel Poinsett, who is so frequently recognized within the south, had Union sympathies. Since Dr. Poinsett died in 1851, it is unknown upon which side of the line Dr. Poinsett would have staked his reputation and future.

— Thomas Leland, M.D., Ph.D.



SOUTH CAROLINA MEDICAL ASSOCIATION

AUXILIARY

LEGISLATION

In 1986-87, SCMAA has been involved in legislative affairs in many ways. Initially in May there was a round table discussion with County Legislative Chairmen at the May Board meeting. During the summer there was a mailgram alert from AMA Auxiliary concerning the Medicare physician fee freeze. And in the fall, the state Board meeting focused on legislation with a talk by Susie Nickles, Director of Political Affairs for SCMA, and the candidates for Lieutenant Governor making a presentation. Details are outlined below.

The May Board meeting of SCMAA included a round table discussion by County Legislative Chairmen and State Legislative Chairmen, Susan Brill and Ina Gottlieb. There was some discussion of what our new positions meant and how to implement these responsibilities. The main thrust was the need to be kept informed of the latest legislative news and keeping our individual groups updated.

In July, there was an action call by AMA on the elimination of the Medicare Fee Freeze by the U. S. House of Representatives. Auxiliary members were urged to send mailgrams to their respective leaders urging an end to the fee freeze. In S. C. mailgrams were sent to Congressman Carroll Campbell. All S. C. County Legislative Chairmen were contacted and they were helpful and concerned. As a result of this effort, 2,000 mailgrams were received by Members of Congress who serve on three major committees: House Ways and Means, House Energy and Commerce and Senate Finance. By a vote of 18-16, a compromise provision dealing with reimbursement was adopted by the House Ways and Means Committee. This was supported by the AMA. This close vote shows the impact of the grassroots support by state and local Medical Societies and Auxiliaries.

In the final Medicare provisions which were adopted, this impact is evidenced by the equal 3.2 percent update in prevailing Medicare charges for both participating and non-participating physicians. Because the gap in payment between participating and non-participating still remains, however, there will continue to be a need for political action.

SCMAA's fall Board meeting was termed Legislative Day. Special guests incuded SCMA's Director of Political Affairs, Susie Nickles and candidates for Lt. Governor, State Senator Nick Theodore and Congressman Tommy Hartnett. Due to a schedule conflict, State Senator John Courson spoke for Congressman Hartnett. Susie Nickles discussed the importance of legislative contacts and the need for physicians and their spouses to be politically active. She also gave an update on the professional liability issue and discussed the new Courson-Doar Tort Reform Bill. Following the political speeches by Senator Courson and Senator Theodore, a brief question and answer session was held. In general, this informative meeting was enjoyed by all those who were present.

Respectfully submitted,

Susan Brill (Mrs. Alan H.)
Legislative Chairman
SCMAA

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